Jet Propulsion Laboratory
California Institute of Technology

4800 Oak Grove Drive
Pasadena, CA 91109-8099

(818) 354-4321

Refer to: 930-019/ESB:lc

September 1, 1999

TO: Distribution

FROM: E. S. Burke

SUBJECT: 03 August 1999 Resource Allocation Review Board (RARB) Meeting Minutes

The following are the minutes of the NASA/JPL Deep Space Network (DSN) Resource Allocation Review Board (RARB) Meeting held at JPL on 03 August 1999. The purpose of these reviews is to address the over subscription of the DSN 26/34/70 meter tracking assets. The Review Board consists of Project Managers, Project Scientists, and key JPL Telecommunications and Mission Operations Directorate (TMOD) managers, or their representatives. The Board is responsible for reviewing new or changed requirements, adopting recommendations to reduce periods of heavy contention, and for controlling changes to requirements.

The review addressed contention in 2000, 2001, and 2002.

Review Board Members

The following Review Board Members, or their representatives, were in attendance:

Gael Squibb	JPL	Chairman / TMOD Director
Carol Boyles	JPL	Genesis Project Manager Representative
Gene Burke	JPL	TMOD Resource Allocation Planning Office
Pam Chadbourne	JPL	DS1 Project Manager Representative
Richard Cook	JPL	Mars Surveyor Operations Project Manager
Steve Coyle	GSFC	MAP, IMAGE Project Manager Representative
Mike Ebersole	JPL	SIRTF Project Manager Representative
Jim Erickson	JPL	Galileo Europa Mission Project Manager
Bob Farquhar	APL	NEAR Mission Manager, CONTOUR
John Gagosian	GSFC	TDRS H,I,J
Ike Gillam	ATSC	CSOC Support Services Manager
Doug Griffith	JPL	TMOD Plans & Commitments Office Deputy Manager
Torrence Johnson	JPL	Galileo Project Scientist
Mike Klein	JPL	Radio Astronomy Project Manager
Dave Linick	JPL	TMOD Operations Program Office Manager
Bob Mase	JPL	Mars Surveyor 2001 Project Manager Representative

Ed Massey	JPL	Ulysses/Voyager Project Manager
Dennis Matson	JPL	Cassini Program Scientist
Bob Mitchell	JPL	Cassini Program Manager
Bob Ryan	JPL	Stardust Project Manager Representative
Steve Saunders	JPL	Mars Surveyor 2001 Project Scientist
Rance Skidmore	Omitron	GOES
Marty Slade	JPL	GSSR Project Manager
Ed Smith	JPL	Ulysses Project Scientist
Joel Smith	JPL	U.S. Space VLBI Project Manager
Joe Statman	JPL	TMOD Engineering Program Office Manager
Bill Worrall	GSFC	Orbiting Satellites Manager (ISTP, ACE, INTEGRAL)
Greg Wright	MSFC	Chandra Project Manager Representative

Review Materials

The following items include material in the handout (Grey book); the WWW-based "Red Book," and presentations not provided until the day of the RARB and bookmarked on the website:

1. Agenda
2. Introduction - G. Squibb
3. Overview - G. Burke
4. Action Items from 02 February 1999 RARB - G. Burke
5. NASA Headquarters Perspective - Dr. Charles P. Holmes, NASA Headquarters, Code SR
6. NASA Headquarters Perspective , Space Communications - James A. Costrell, NASA Headquarters, Code MT
7. NASA SOMO Mission Services Status - John Dalton, SOMO Mission Services Manager
8. SOMO Data Services & DSMS Operations - Dave Linick
9. DSN Y2K Transition Strategy - J. A. Hodder
10. TMOD DSMS Plans & Commitments Program Office - D. Griffith
11. TMOD Office 940 - Engineering - K. Kimball
11. Forecast Methodology for Reduced Network Loading - David G. Morris
12 MESSENGER - R. Farquhar (APL)
14. Resource Contention Summary - G. Burke
15. Resource Contention 2000-2009 - Frank Leppla (Updated Red Book Information)
16. Contention Resolution
17. Action Items

***Introduction* - *G. Squibb*, RARB Chair**

After welcoming the participants, several topics were briefly discussed:

1. The DSN Ka-Band upgrade, projected a year ago, has begun.
2. Although news of the NASA budget seems negative, JPL expects to be funded; however, final word will not be known until October.
3. TMOD organizational changes were reviewed (see org chart).

Overview - G. Burke

The agenda was reviewed and the Review Board introduced.

Action Items from the 02 February 1999 RARB - G. Burke

The first two Action Items, pertaining to DSN's Y2K transition, remain open, and will not close until the end of February 2000. Action Item # 4 remains open because Mars Polar Lander had not yet determined its landing site. The other three AIs had been closed.

NASA Headquarters Perspective - C. Holmes

The presentation covered OSS organization, program highlights, SOMO budget notes and appropriation activities.

NASA Headquarters Perspective - J. Costrell

A wide range of subjects included major program priorities, space communication issues, budget concerns/thrusts, interagency strategic planning, interoperability plenary, and the new NASA tracking station at Svalbard, Norway.

NASA SOMO Mission Services Status - J. Dalton

This segment addressed the following: Customer Commitment Process, Services Catalog, Pricing of SOMO Services, and Reviews of PSLAs with Mission Organizations.

NASA SOMO Data Services & DSMS Operations - D. Linick

SOMO Commercialization activities and DSMS Operations organization were presented.

DSN Y2K Transition Strategy - J. Hodder

Staffing, strategy, timeline, and project participation were discussed.

TMOD (DSMS) Plans & Commitments - D. Griffith

Updates were provided on mission sets, P&C organization charts and mission support assignments.

Office 940-Engineering - K. Kimball

The latest activities in the Network Control Project, system upgrades/changes, and other support capabilities were provided, along with summaries of near- and long-term downtime.

Forecast Methodology for Reduced Network Loading - D. Morris

New initiatives are underway in the continuing search for ways to combat DSN over subscription.

MESSENGER* - *R. Farquhar

This new Discovery mission to Mercury was described.

Resource Contention Summary* - *G. Burke

Projected Lost Time and Yearly Supportable Time Summaries were given for the period 1999-2009 for the 26/34/70M systems. In addition, subnet contention for 2000-2002 was shown: ***Shown on page 102***

Resource Contention* - *F. Leppla

This main portion of the review began with presentations of Loading Study Initial Conditions and Changes in Project Requirements. Background/source information was also shown (***Shown on page 108***) . The following portion of the minutes describes in detail the results of RARB negotiations, and will be used as the new baseline for DSN resource allocation.

Contention Resolution- ***Shown on page 110***

Action Item Summary - ***Shown on page 115***

The next meeting of the Resource Allocation Review Board will be Tuesday, 01 February 2000, at 8:30 am in JPL Building 180, Room 101.

ACE
Afkhami, F. . . . . GSFC 453.1*
Machado, M. J. . . . . GSFC Code 453.1*
Myers, David A. . . . . GSFC Code 453.1*
Sodano, R. J. . . . . GSFC Code 581.1*

Canberra Deep Space Communications Complex
Churchill, P. . . . . CDSCC #
Jacobsen, R. . . . . CDSCC #
O'Brien, J. J. . . . . CDSCC #
Ricardo, L. . . . . CDSCC #
Robinson, A. . . . . CDSCC #

Cassini
Bryant, L. W. 230-101
Chin, G. E 230-301
Doody, D. F. 230-301
Frautnick, J. C. 230-101
Madrid, Sr., G. A. 230-301
Maize, E. H. 230-104
Matson, D. L. (PS) 183-501
Miller, L. J. 230-260
Mitchell, R. T. (PM) 230-260
Miyoshi, T. 230-104
Sakamoto, L. L. 230-104

Chandra
Digesu, S. . . . . MSFC Org. EO26*
Gage, K. R. . . . . SAO*
O'Dell, S. L. . . . . MSFC Org. ES84*
Weisskopf, M. C. (PS) . . . . . MSFC Org. ES01*
Wojtalik, F. S. (PM) . . . . . MSFC Org. TA01*
Wright, G. M. . . . . MSFC Org. TA21*

Comet Nucleus Tour (CONTOUR)
Chiu, M. C. (PM) . . . . . APL 4-362*
Dunham, D. . . . . APL 4-134*
Farquhar, R. (MM) . . . . . APL 2-155*

Crustal Dynamics
Clark, T. A. (PM) . . . . . GSFC Code 920.3 *
Vandenberg, N. R. . . . . GSFC Code 920.1*
Wolken, P. R. 507-120

Deep Space 1
Abramo, C. A. 230-102
Chadbourne, P. 230-207
Lehman, D. H. (PM) 230-207
Nelson, R. M. (PS) 183-501
Rayman, M. D. 230-207
Smith, R. R. 230-207
Toyoshima, B. 301-385
Varghese, P. 230-207

Deep Space 3
Gallagher, D. B. 301-486

Deep Space 4
Benson, R. D. 264-844
Grimes, J. M. 301-350
Muirhead, B. K. (PM) 301-350
Tan-Wang, G. H. 301-350

Director's Office
Chahine, M. T. 180-904
Dumas, L. N. 180-904
Stone, Jr., E. C. 180-904

Explorers
Barrowman, J. S. (PM) . . . . . GSFC Code 410*

Galileo
Abramo, C. A. 230-102
Erickson, J. K. (PM) 264-419
Johnson, T. V. (PS) 183-501
McClure, Jr., J. R. 230-102
Sible, Jr., R. W. 264-419

Genesis
Boyles, C. A. 264-370
Burnett, D. S. (PI) . . . . . CIT 170-25
Sasaki, C. N. (PM) 264-370
Sweetnam, D. N. 264-370

GOES
Allsbrook, J. W. . . . . HSC*
Birnbaum, P. . . . . HSC*
Criddle, K. E. 301-125J
LeBair, W. J. . . . . GSFC Code 415.0*
Settles, M. . . . . NOAA*
Skidmore, R. W. . . . . GSFC Code 450.0*

Goldstone Complex
McCoy, J. DSCC-57
Mischel, D. DSCC-37
Sturgis, L. DSCC-33

Goldstone Orbital Debris Radar (GODR)
Goldstein, R. M. (PM) 300-227

Goldstone Solar System Radar (GSSR) - Asteroid
Haldemann, A. F. 238-420
Ostro, S. J. 300-233

Goldstone Solar System Radar (GSSR) - Planets
Haldemann, A. F. 238-420
Slade, III, M. A. (PM) 238-420

Gravity Probe B
Keiser, M. (PS) . . . . . Stanford Univ.*
Shapiro, Prof. I. I. . . . . Harvard*

ICE Radio Science
Woo, R. 238-725

IMAGE
Burch, J. . . . . SwRI*
Burley, R. J. . . . . GSFC Code 632*
Dew, H. C. . . . . GSFC Code 566*
Gibson, W. C. . . . . SwRI*
Green, J. L. . . . . GSFC Code 630*
Gustafson, W. A. . . . . GSFC Code 568.1*
Killough, R. . . . . SwRI*
Tapley, M. B. . . . . SwRI*
Volpe, F. A. (PM) . . . . . GSFC Code 410*

INTEGRAL
Clausen, K. . . . . ESA/ESTEC*
Machi, D. . . . . GSFC Code 404*
Popken, L. . . . . ESA / ESTEC*

ISTP (Cluster II)
Christensen, J. L. . . . . GSFC Code 404*
Huff, R. . . . . U. of Iowa*
Machi, D. (PM) . . . . . GSFC Code 404*
Worrall, W. D. . . . . GSFC Code 630.1*

ISTP (GEOTAIL/POLAR/SOHO/WIND)
Acuna, M. H. (PS) . . . . . GSFC Code 695*
Adams, Jr., J. F. 502-320
Alexander, H. 502-320
Bush, R. I. . . . . Stanford Univ.*
Dutilly, R. N. . . . . GSFC Code 581.1*
Guit, W. J. . . . . GSFC Code 453.1*
Gurman, J. B. . . . . GSFC Code 682.3*
Leventry, G. A. . . . . GSFC Code 453.1*
Mahmot, R. E. . . . . GSFC Code 584.0*
Milasuk-Ross, J. . . . . GSFC Code 453.1*
Miller, K. A. . . . . GSFC Code 453.1*
Mish, W. H. . . . . GSFC Code 690*
Ogilvie, K. W. . . . . GSFC Code 690.0
Worrall, W. D. . . . . GSFC Code 630.1*

JPL/General
Acton, C. H. 301-125L
Bartos, K. P. 144-201
Beswick, C. A. 301-335
Boain, R. J. 264-686
Burow, N. A. 238-540
Chien, S. A. 126-347
Diehl, R. E. 301-180
Frederick, S. Y. 180-202
Gleason, J. A. 230-305
Hastrup, R. C. 301-170U
Hirst, E. A. 301-180
Kahr, B. E. 301-385
Kee, L. A. 301-180
Kelley, J. P. 511-101
Komarek, T. A. 161-213
Kursinski, E. R. 238-600
Lam, R. K. 525-3660
Manshadi, F. 238-725
McCarthy, T. W. 303-403
Meeks, W. 601-105
Randolph, J. E. 301-170U
Rhodes, Jr., E. J. 169-506
Tan, K. 230-207
Vu, Q. A. 525-3631
Weber, III, W. J. 180-500
Woo, H. W. 301-385
Yuen, J. H. 238-420

Lunar-A
Chang, A. F. 264-844
Mizutani, H. . . . . ISAS*
Nakajima, T. . . . . ISAS*

Lunar Prospector/Pioneer
Binder, A. (PS) . . . . . ARC 244-14*
Cox, S.A. (PM) . . . . . ARC 244-14*
Day, J. . . . . Lockheed *
Lasher, L. E. (PM) . . . . . ARC 244-14*
Lozier, D. W. . . . . ARC 244-14*
Smith, M. A. . . . . ARC 244-14*
Tay, P. W. 301-341

Madrid Deep Space Communications Complex
Chamarro, A. . . . . MDSCC #
Rosich, A. . . . . MDSCC #

MAP
Bennett, C. L. (PS) . . . . . GSFC Code 685*
Citrin, E. A. . . . . GSFC Code 410.2*
Coyle, S. E. . . . . GSFC Code 581*
Day, R. M. (PM) . . . . . GSFC Code 410.2*
Dent, C. P. . . . . GSFC Code 584*
Powers, M. K. . . . . GSFC Code 567*
Volpe, F. A. (PM) . . . . . GSFC Code 410*

Mars Express
Campbell, J. K. 264-426
Flamini, E. . . . . ASI*
Okolicsanyi, M. . . . . ASI*
Olivieri, A. . . . . ASI*
Schmidt, R. . . . . ESA/ESTEC*

Mars Global Surveyor
Albee, A. (PS) 264-282
Arroyo, B. 264-235
Beerer, J. G. 264-235
Brower, E. E. 264-235
Cook, R. A. (PM) 264-214

Mars Surveyor 98 Orbiter/Lander
Arroyo, B. 264-235
Cook, R. A. (PM) 264-214
Knocke, P. C. 264-235
Zurek, R. W. (PS) 183-335

Mars Surveyor 2001 Orbiter/Lander
Arroyo, B. 264-235
Harris, J. A. 264-214
Lopez, S. 264-214
Mase, R. A. 264-380
Pace, Jr., G. D. (PM) 264-255
Plaut, J. J. 183-501
Salvo, C. G. 179-220
Saunders, R. S. (PS) 180-701

Mars Surveyor 2003 Orbiter/Lander
Mars Surveyor 2005 Orbiter/Lander
Adler, M. 264-426
Arroyo, B. 264-235
Lee, W. J. 301-180
Lock, R. E. 301-235
O'Neil, W. J. (PM) 264-426
Roncoli, R. B. 301-140K

Mars Surveyor 2007
Cutts, J. A. 264-723

MUSES-CN
Chang, A. F. 264-844
Jones, R. M. (PM) 233-200
Kawaguchi, J. . . . . ISAS*
Yeomans, D. K. (PS) 301-150

NASA Headquarters
Bergstralh, J. T. . . . . Code SR*
Boyce, J. M. . . . . Code SR*
Brewer, D. A. . . . . Code SM*
Costrell, J. A. . . . . Code MF*
Dahl, M. R. . . . . Code SD*
Holmes, C. P. . . . . Code SR*
Howard, R. J. . . . . Code SM*
Huddleston, W. T. . . . . Code SD*
Jones, W. V. . . . . Code SR*
LaPiana, L. S. . . . . Code SD*
Lavery, D. B. . . . . Code SM*
Ocampo, A. C. . . . . Code SD*
Pilcher, C. B. . . . . Code S*
Piotrowski, W. L. . . . . Code SD*
Riegler, G. R. . . . . Code SR*
Spearing, R. E. . . . . Code M-7*
Thronson, H. . . . . Code SR*
Wagner, W. J. . . . . Code SR*
Williams, R. L. 180-300
Withbroe, G. L. . . . . Code S*

NASA/GSFC/General
Buczkowski, V. R. . . . . GSFC Code 430*
Currier, S. F. . . . . Wallops, Bldg. E106*
Harris, R. N. . . . . GSFC Code 450*
Marinaccio, C. A. . . . . GSFC Code 453.7*
Martin, J. B. . . . . GSFC Code 450*
Mathis, E. S. . . . . GSFC Code 450.1*
Purdy, C. L. . . . . Wallops, Bldg. F6*
Schaub, M. B. . . . . GSFC Code 450.A*
Williams, A. K. . . . . GSFC Code 450.A*

NASA/SOMO
Bull, Jr., G. W. . . . . JSC Code DB*
Dalton, J. T. . . . . GSFC Code 423.0*
Davidson, W. L. . . . . JSC Code TR*
Hall, V. F. . . . . JSC Code TG*
Thompson, E. W. . . . . JSC Code TE*

NEAP
King, J. A. . . . . SpaceDev*
Ridenoure, R. . . . . SpaceDev*

NEAR
Antreasian, P. G. 301-276
Dunham, D. . . . . APL 4-134*
Farquhar, R. (MM) . . . . . APL 2-155*
Holdridge, M. . . . . APL 13N-319*
McAdams, J. . . . . APL 4-134*
Moore, G. A. . . . . APL 13N-319*
Santo, A. G. . . . . APL M1-126*
Williams, B. G. (MM Rep) 301-125J

NOZOMI (Planet B)
Chang, A. F. 264-844
Hayakawa, H. . . . . ISAS*
Nakatani, I. . . . . ISAS*
Niemann, H. B. . . . . GSFC Code 915.0*
Ryne, M. 301-276
Tsuruda, K. . . . . ISAS*

Outer Planets/Solar Probe
Carraway, J. B. 301-335
Ludwinski, J. M. 301-170U

Radio Astronomy
Klein, M. J. (PM) 303-402
Kuiper, T. B. (PS) 169-506
Martinez, G. 507-120
VanAllen, J. A. . . . . U. of Iowa*
Wolken, P. R. 507-120

Rosetta (ROSE)
Devirian, M. 233-200
Wellman, J. B. 233-200

SESPD
Barnett, P. M. 180-703
Elachi, C. 180-704

Solar Stereo
Baer, G. E. . . . . APL 36-109*
Colon, G. . . . . GSFC Code 410*
Driesman, A. S. . . . . APL MD1-124
Harper, A. D. . . . . GSFC Code 410*
Ossing, D. A. . . . . APL 36-112*

Space Geodesy (NASA Goddard)
Clark, T. A. (PM) . . . . . GSFC Code 920.3 *
Vandenberg, N. R. . . . . GSFC Code 920.1*

Space Infrared Telescope Facility (SIRTF)
Ebersole, M. M. 264-767
Kwok, J. H. 264-767
Simmons, L. L. (PM) 264-767

Stardust
Atkins, K. L. (PM) 301-429
Duxbury, T. C. 301-429
Ryan, R. E. 301-341

TDRS - HIJ
Ambrose, L. L. . . . . GSFC Code 451.0*
Gagosian, J. . . . . GSFC Code 571.0*

TMOD
Coffin, R. C. 303-400
Doms, P. E. . . . . .
Edwards, C. D. 303-402
Mathison, R. P. 303-400
Polansky, R. G. 303-400
Rodrigues, M. J. 303-400
Scheck, T. R. 303-400
Squibb, G. F. 303-400

TMOD/Engineering

Dowen, A. Z. 303-404
Freiley, A. J. 303-404
Kimball, K. R. 303-404
Liewer, K. M. 238-700
Osman, J. W. 303-404
Roberts, J. P. 507-105
Statman, J. I. 303-404

TMOD/Operations

Andrews, M. M. 507-120
Coleman, G. D. 600-174
Covate, J. T. 507-105
Donovan, P. L. 507-120
Falin, B. W. 303-403
Frazier, R. 507-105
Gillam, I. T. 502-400
Green, J. C. 507-215
Gugel, R. 507-120
Hall, H. G. 230-109
Hodder, J. A. 303-403
Knight, A. G. 507-120
Korfanta, J. 787-100
Landon, A. J. 507-120
Linick, T. D. 303-403
Nevarez, R. E. 507-120
Pivar, B. W. 507-120
Recce, D. J. 507-105
Salazar, A. J. 303-403
Short, A. B. 507-120
Spradlin, G. L. 303-402
Wackley, J. A. 303-403
Waldherr, S. 507-120
Yetter, B. G. 507-120

TMOD/Plans & Commitments

Abraham, D. S. 301-472
Beers, A. I. 264-844
Benson, R. D. 264-844
Berman, A. L. 264-844
Beyer, P. E. 264-844
Black, C. A. 303-402
Cesarone, R. J. 303-402
Chang, A. F. 264-844
Gillette, R. L. 264-844
Griffith, D. G. 303-402
Holmes, D. P. 264-844
Hurd, W. J. 303-402
Martin, W. L. 303-402
McKinney, J. C. 264-844
McLaughlin, F. D. 303-402
Miller, R. B. 303-402
Noreen, G. K. 303-402
Pollmeier, V. M. 303-402
Poon, P. T. 264-844
Stelzried, C. T. 303-402
Stewart, J. M. 264-844
Tai, W. S. 303-402

TMOD/RAPSO

Baker, R. R. 303-403
Bethel, S. E. 507-320
Borden, C. S. 601-237
Burke, E. S. 303-403
Dillard, D. E. 507-320
Hampton, E. 600-174
Hincy, W. 600-174
Kehrbaum, J. M. 301-180
Kim, K. 600-174
Lacey, N. 600-174
Leppla, F. B. 601-110
Lineaweaver, S. 600-174
Morris, D. G. 601-110
Wang, Y-F. 601-237
Zendejas, S. C. 601-237

Ulysses/Voyager

Angold, N. G. 264-114
Beech, P. 264-318
Bray, T. L. 264-114
Hall, Jr., J. C. 264-801
Kurth, W. . . . . U. of Iowa*
Massey, E. B. (PM) 264-801
Nash, J. C. 264-801
Smith, E. J. (PS) 169-506
Webb, I. J. 264-114

U.S. Space VLBI

Altunin, V. I. 303-402
Miller, K. J. 264-802
Preston, R. A. (PS) 238-332
Smith, J. G. (PM) 264-828

YOHKOH

Chang, A. F. 264-844

Other Organizations

Bridges, T. . . . . Lockheed*
Gavaletz, K. . . . . LMSOC*
Hall, L. . . . . CSOC*
Hanson, R. . . . . LMSOC*
Hashimoto, T. . . . . ISAS*
Sawai, S. . . . . ISAS*
Yoshikawa, M. . . . . ISAS*

---

* regular US mail label

sent via TMOD consolidated weekly shipment

Please mark any additions, deletions, or corrections to this distribution list and return to:

Robert R. Baker
Jet Propulsion Laboratory
4800 Oak Grove Drive, 303-402
Pasadena, CA 91109 / 818-354-7859
email: robert.r.baker@jpl.nasa.gov

F:\Michele\RAPSO-files\RARB_Files\RARB dist - Michele updates.wpd
September 1, 1999 (8:39PM)

Resource Allocation Review Board
03 August 1999
AGENDA

• INTRODUCTION	G. Squibb	8:30
• OVERVIEW & ACTION ITEMS	G. Burke	9:00
• NASA HQ PERSPECTIVE		
– Code S	C. Holmes	9:10
– Code M	J. Costrell	9:25
• NASA SOMO PERSPECTIVE		
– Mission Services Manager	J. Dalton	9:40
– Data Services Manager	D. Linick	9:55
• JPL DSMS OPERATIONS PROGRAM OFFICE	D. Linick	10:10
– Y2K Operations Plan	J. Hodder	10:25
• JPL DSMS PLANS & COMMITMENTS PROGRAM OFFICE	D. Griffith	10:40
• JPL DSMS ENGINEERING PROGRAM OFFICE	K. Kimball	10:55
– Y2K Compliance		
– JPL DSMS Implementation Plans and Impacts		
• FORECAST METHODOLOGY FOR REDUCED NETWORK LOADING	D. Morris	11:15
• NEW AND MODIFIED PROJECT REQUIREMENTS		
– Messenger	R. Farquhar	11:30
• RESOURCE CONTENTION SUMMARY	G. Burke	11:40
• RESOURCE CONTENTION		
– Analysis & Recommendations	F. Leppla	11:50
– Responses	Projects	
– Discussion / Decisions	All	
NOTE: SOHO Special Awards	B. Worrall	Lunch
• ACTION ITEMS & SUMMARY	G. Burke	

RESOURCE ALLOCATION REVIEW

INTRODUCTION

JPL

Gael Squibb

RESOURCE ALLOCATION REVIEW

INTRODUCTION

- WELCOME TO THE RESOURCE ALLOCATION REVIEW
  - BOARD WAS ESTABLISHED TO PROVIDE CONTROL OF TRACKING REQUESTS — 34/70/26 METER SUBNETS
  - RECOMMEND RESOURCE ALLOCATION AND ASSIST IN CAPACITY PLANNING
- REQUIREMENTS 1999 THROUGH 2009
- CONFLICTS IN 2000, 2001, AND 2002 NEED RESOLUTION

TELECOMMUNICATIONS AND MISSION OPERATIONS DIRECTORATE

ORGANIZATION CHART

Effective: July 26, 1999

TELECOMMUNICATIONS AND MISSION OPERATIONS DIRECTORATE
G.F. Squibb, Director
R.C. Coffin, TMOD Program Manager
P.E. Doms, DSMS Program Manager

900
Vacancy, Manager, SOMO Data Services
A.J. Hooke, Manager, SOMO Standards Program
R.P. Mathison, TMOD Chief Engineer & Y2k Project Manager
R.G. Polansky, Assistant Chief Engineer
Directorate Technical Staff:
E.L. McKinley M.J. Rodrigues A.M. Tavormina

910
BUSINESS OPERATIONS OFFICE
T.R. Scheck, Mgr.

905
TMOD SYSTEMS ENGINEERING AND STANDARDS OFFICE
W. Tai, Mgr.

901
MARS NETWORK PROJECT OFFICE
C.D. Edwards, Mgr.
Vacancy, Dep. Mgr.

902
PROJECT MISSION OPERATIONS OFFICE
G.F. Squibb, Act. Mgr. (AD)

903
MISSION DATA SYSTEM OFFICE
A. Sacks, Mgr.

920
DSMS PLANS AND COMMITMENTS PROGRAM OFFICE
R.B. Miller, Mgr.
D.G. Griffith, Dep. Mgr.

930
DSMS OPERATIONS PROGRAM OFFICE
T.D. Linick, Mgr.
J.A. Wackley, Dep. Mgr.

940
DSMS ENGINEERING PROGRAM OFFICE
J.I. Statman, Mgr.
J.C. Klose, Dep. Mgr.

970
TMOD TECHNOLOGY PROGRAM OFFICE
J.R. Lesh, Act. Mgr.
J.R. Lesh, Dep. Mgr.

950
GALILEO PROJECT
J.K. Erickson, Mgr.
R.W. Sible, Dep. Mgr.

960
U.S. SPACE VLBI PROJECT
J.G. Smith, Mgr.
R.D. Wietfeldt, Dep. Mgr (AD)

980
VOYAGER / ULYSSES PROJECT
E.B. Massey, Mgr.

990
CASSINI PROGRAM
R.T. Mitchell, Mgr.
Vacancy, Dep. Mgr.
J.M. Gunn, Asst. Pgrm. Mgr. For Development

Original signed

G.F. Squibb, Director for
Telecommunications and Mission Operations

99-244

03 Aug 99 RARB

RESOURCE ALLOCATION REVIEW

OVERVIEW AND REVIEW OF ACTION ITEMS

Gene Burke

RESOURCE ALLOCATION REVIEW

CONTENTION RESOLUTION PROCESS

- CONTENTION EXPLANATION
- RESOURCE ANALYSIS TEAM (RAT) RECOMMENDATIONS
- PROJECT RESPONSE TO RECOMMENDATIONS
- REVIEW BOARD DISCUSSIONS
- REVIEW BOARD DECISIONS

RESOURCE ALLOCATION REVIEW

Action Item Summary

AI#	*CP#*	*Year*	*Month(s)*	*Week(s)*	*System*	*Responsible*	*Due Date*	*Status*
01	**n/a**	**1999**	**---**	**---**	**All**	**All Projects E. Burke**	**Monthly thru 3/2000**	**Open**

ACTION: Y2K: All projects that will be in Operations between November 1999 and February 2000 identify critical mission periods and send the list of periods and the activity description to E. Burke by 2/28/99. Update on the last Friday of each month through March 2000. E. Burke will consolidate and provide to G. Squibb.

02	**n/a**	**1999**	**---**	**---**	**All**	**All Projects E. Burke**	**Monthly thru 3/2000**	**Open**

ACTION: Y2K: All projects that will be in Operations during the Y2K + 36 hour turnover (1999 to 2000): For the period Y2K – 24 hours through Y2K + 36 hours (both 0000 UTC, 1 January 2000 and 0000 UTC, 29 February 2000) identify all command periods and science downlink periods for your missions. For each period identify effects of missing the period. Update monthly on the last Friday of each month through March 2000. Submit to E. Burke, who will consolidate and provide to G. Squibb.

RESOURCE ALLOCATION REVIEW

AI#	*CP#*	*Year*	*Month(s)*	*Week(s)*	*System*	*Responsible*	*Due Date*	*Status*
03	**06**	**1999**	**October**	**42 – 48**	**34BWG**	**B. Arroyo**	**03/30/1999**	**Closed**

ACTION: DS1, Mars Global Surveyor (MGS) and Mars Climate Orbiter (M98O) agree on an acceptable compromise for providing DS1 a weekly command support.
RESPONSE: As of May 20, this period is beginning to be addressed in the Mid-Range Allocation meeting. Negotiations will use that forum. If problems occur, then a future JURAP may be used.

04	**07**	**1999**	**January**	**01**	**70M**	**P. Knocke**	**09/1999**	**Open**

ACTION: Mars Polar Lander (M98L) will provide to RAPSO planned landing coordinates and view period predictions as soon as possible so that effective mid-range allocation of antenna resources can be planned for Surface Operations (12/3/1999 through 3/31/2000).

05	**21**	**2000**	**November**	**45 – 52**	**DSS-34,54**	**C. Dent**	**03/02/1999**	**Closed**

ACTION: MAP Project to provide a view period file for RAPSO.
RESPONSE: These were provided on 2/11/1999 and closed the action item.

RESOURCE ALLOCATION REVIEW

AI#	*CP#*	*Year*	*Month(s)*	*Week(s)*	*System*	*Responsible*	*Due Date*	*Status*
06	**28**	**2001**	**March**	**12 – 14**	**DSS-63**	**N. Lacey**	**03/02/1999**	**Closed**

ACTION: Investigate and report whether the motor control center replacement can be included in the planned X-band uplink implementation downtime currently scheduled for July – October (weeks 31 – 40).
RESPONSE: This implementation moved from March 2001 to July 2000. Affected missions were contacted and agreed to this new period and this action is considered closed as of 3/2/1999. New start and end dates are 7/10/2000 through 7/30/2000 (weeks 28 – 30).

07	**31**	**2001**	**January**	**01 – 05**	**34 HEF**	**D. Morris**	**05/20/1999**	**Closed**

ACTION: RAPSO provide new recommendation for this contention between Cassini, DS1, Maintenance, Mars Global Surveyor (MGS), Mars Climate Orbiter (M98O) and NEAR.
RESPONSE: The August RARB survey of mission requirements received updates from DS1 and MGS for the period of this contention. This period will be reviewed in preparation for the August RARB. If it warrants discussion, it will be identified as a new contention.

OSS News

Presentation to the

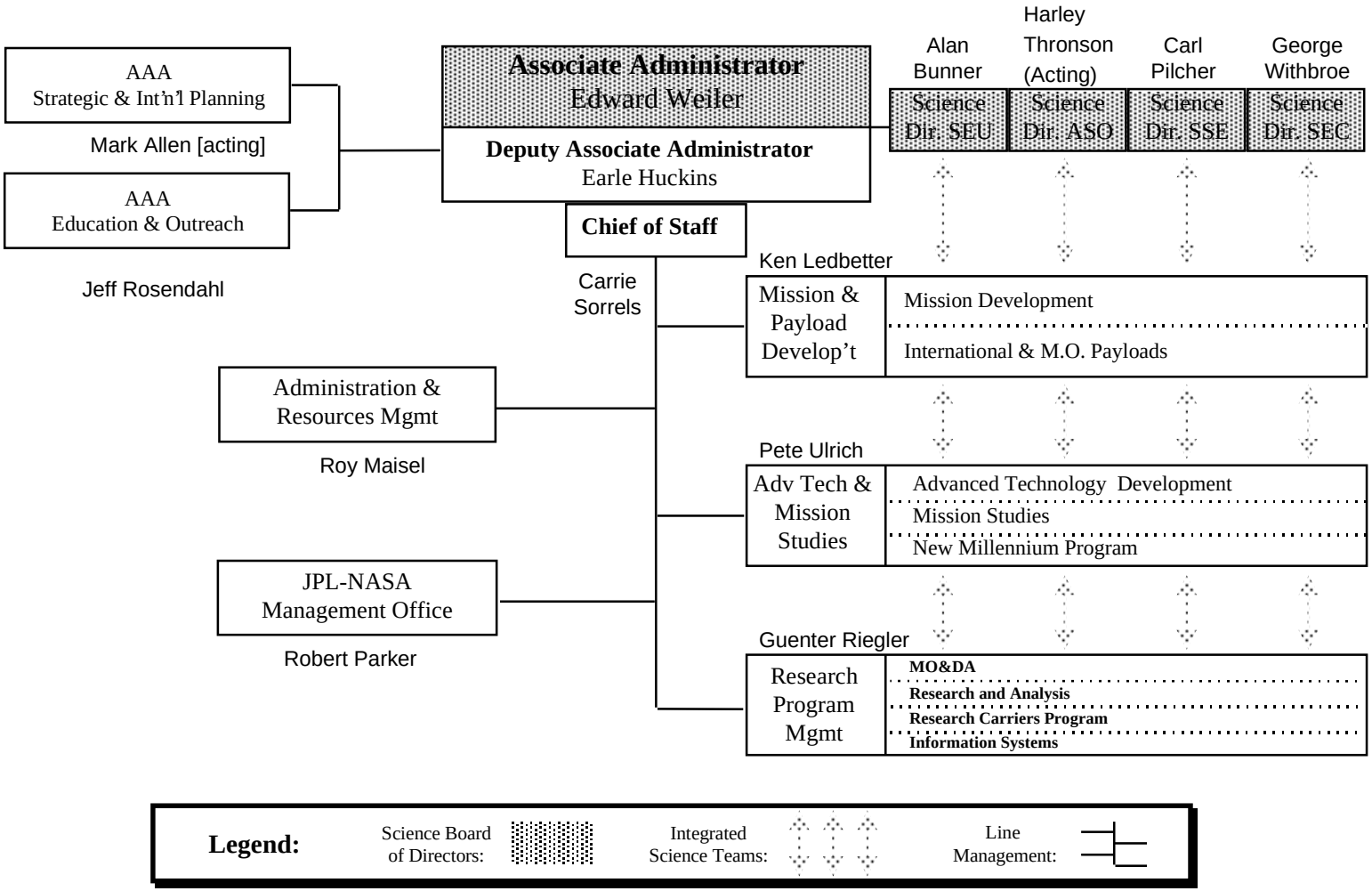
Resource Allocation Review Board

Aug 3, 1999

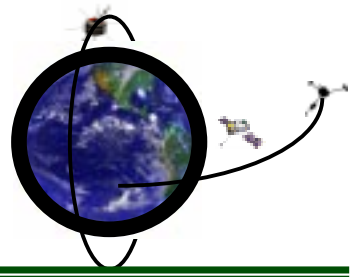
Dr. Charles P. Holmes
Research Program Management Division
Office of Space Science - NASA Headquarters

- **OSS organization update**
- **Program highlights**
- **SOMO budget notes**
- **Appropriation activities**

Organization Chart
Office of Space Science



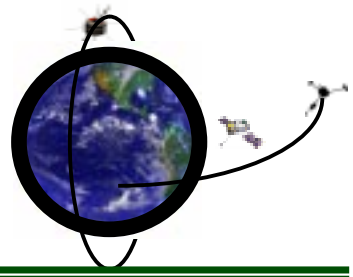
New Positions in RPM



- **Guenter Riegler is the Division Director**
- **Hashima Hasan joins as the UV/Optical Discipline Scientist**
- **IPAs**
  - Dan Golembek succeeds Howard Smith
  - Phil Crane succeeds Hashima Hasan
  - Phil Kniffen succeeds Paul Hertz
  - Need for Magnetospheric Scientists

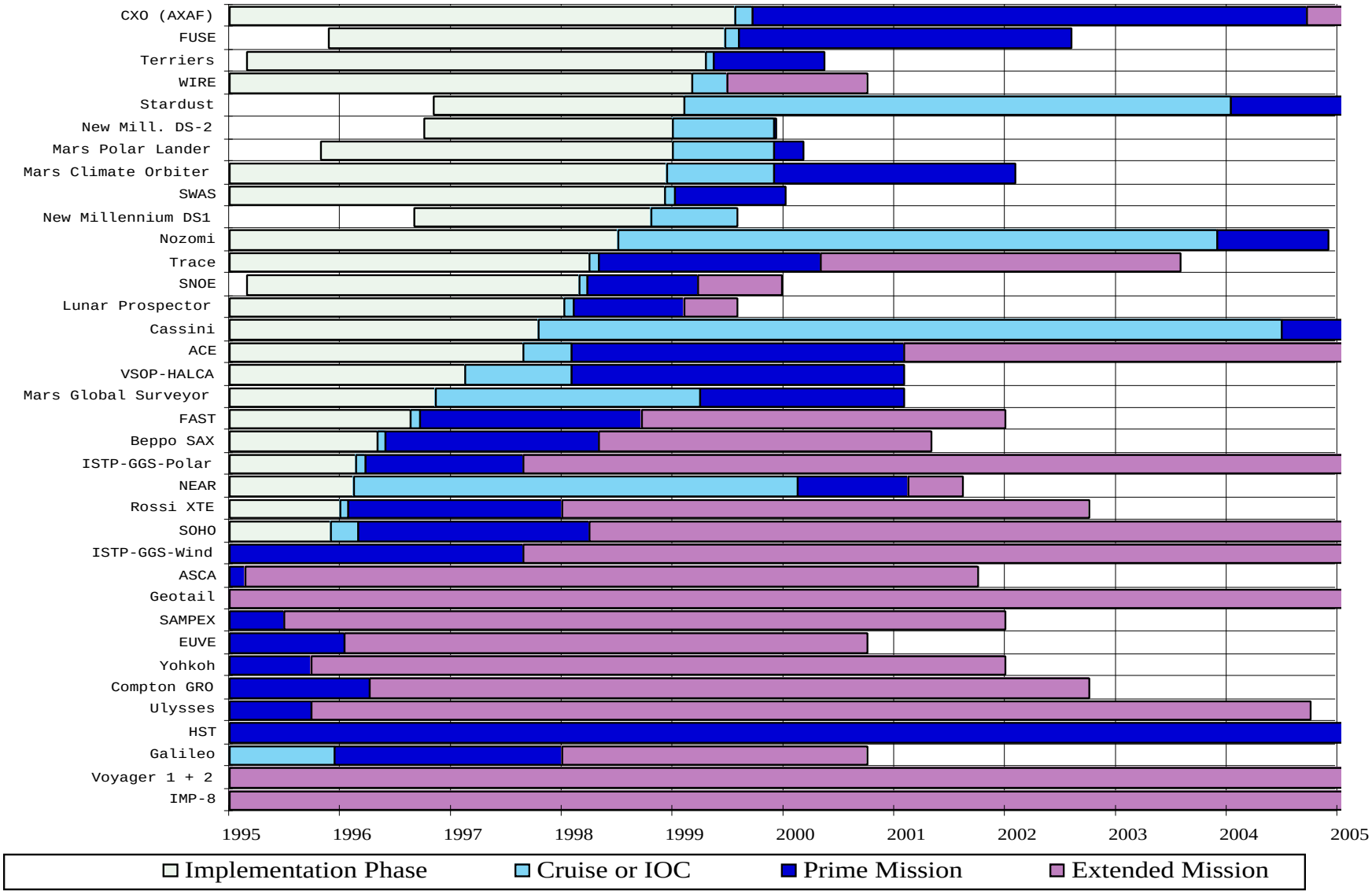
- **New SST positions have been advertised:**
  - Senior Scientist for Astrobiology
  - Senior Scientist for Space Science Research
  - Senior Scientis for Planetary Protection
  - Detailed vacancy announcements, including application instructions, can be found under Senior Executive positions at http://www.usajobs.opm.gov or a copy can be obtained by calling (202) 358-0347 or (202) 358-1588.

Recent Program Highlights

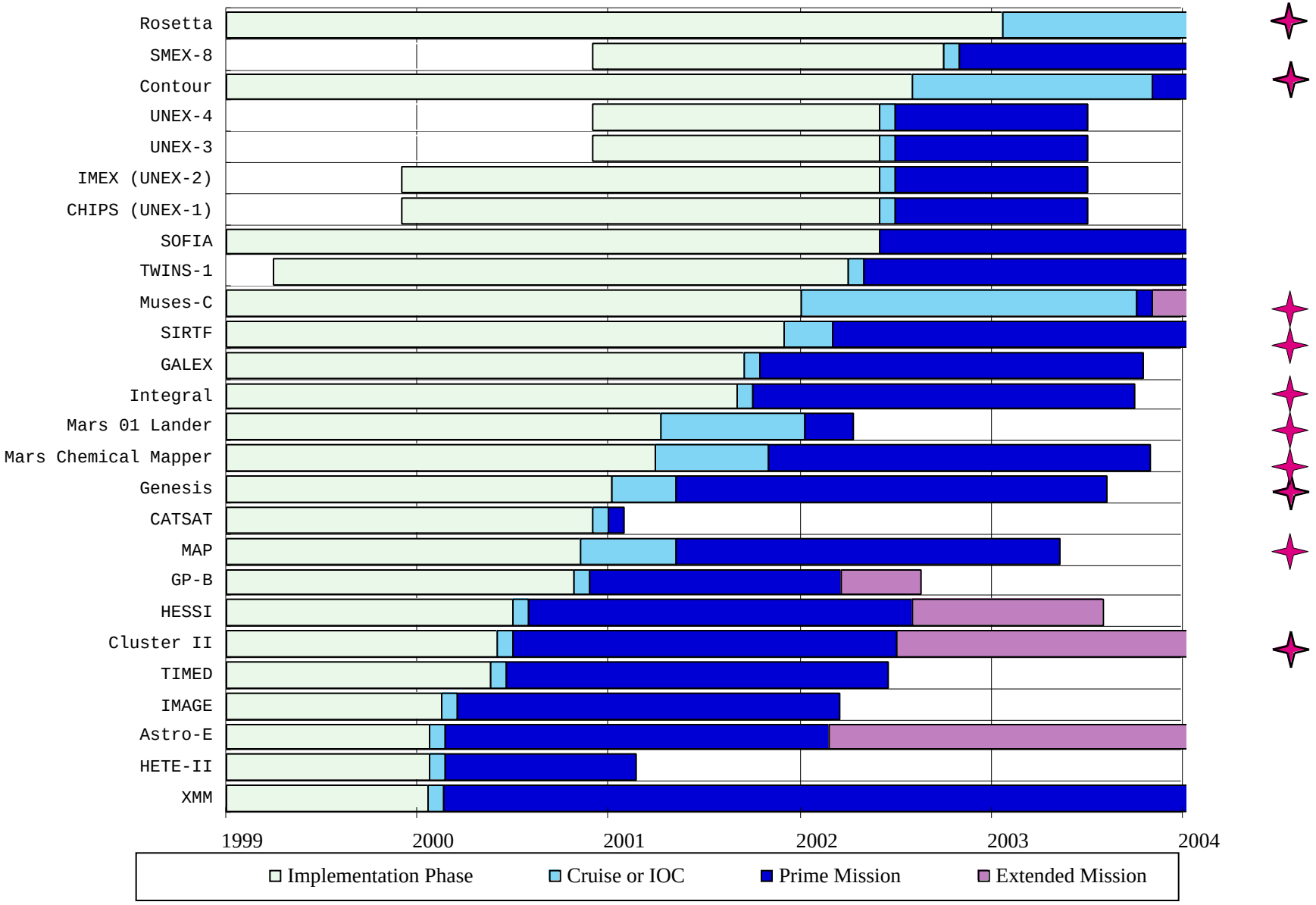


- **Mission Highlights**
  - WIRE - Prime mission failure
    - Residual science - asteroseismology from the star tracker data
    - WIRE Test Bed - proposals are being submitted to the Explorers Program
  - TERRIERS - waiting for favorable sun angle on arrays
  - FUSE - in-orbit checkout
  - CXO - final orbit burns and in-orbit checkout
  - DS-1 - Successful encounter of asteroid Braille
  - Lunar Prospector impacted into lunar crater on July 31
  - Cassini flyby of Earth on Aug 17
  - MCO and MPL at Mars in Dec
- **Discovery Selections - Deep Impact & Messenger**
- **MIDEX Selections in late Sept.**
- **SMEX AO to be released about Sept. 15**
- **Other AO's**
  - Check out OSS web page
  - Subscribe to OSS research announcements

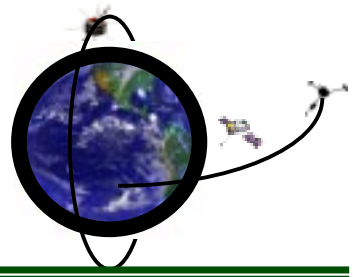
Space Science Operating Missions



Space Science Launches 00 - 02



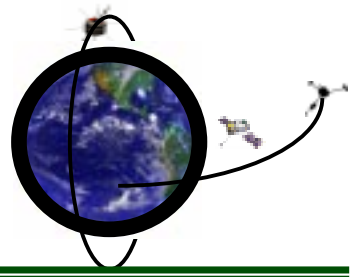
SOMO Budget



- **SOMO budget for FY 00 - 04 presented some serious problems caused by**
  - The ‘management challenges’ in POP 98 and in POP 99
  - Large anticipated costs for CSOC services to missions
    - Immature cost estimation procedure where costs are derived from the PSLAs
    - New work for CSOC
- **The budget problems are being worked by SOMO, the Enterprises, and the CIC**
  - Optimistic that budget problems for FY 00 will be resolved

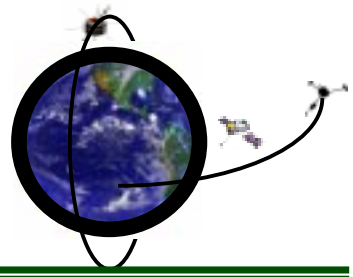
- **Need the projects to stay on top of the mission service costs**
  - Review the PSLA - update as necessary
  - Review the CSOC translation of the PSLA to mission service requirements
  - Point out inappropriate cost estimates
  - Work with John Dalton and the Center Mission Service Managers
  - We are attempting to get one-on-one negotiations between CSOC and each of the projects
  - We are attempting to get modifications to the process for estimating service costs

AA comments on the House Subcommittee report (7/28)



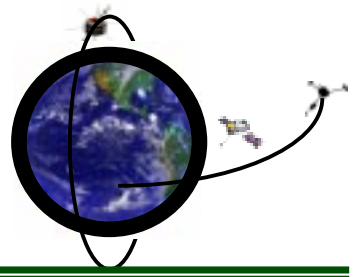
- The overall Space Science budget request for FY 2000 is only 3.6% higher than FY 1999 ($2,196.6M vs. $2,119.2M), little more than inflation. High-priority programs expecting to grow (within those totals) include Mars exploration and the astronomical search for Origins and other planetary systems.
- The proposed cuts represent a 30% reduction to Space Science.
- The subcommittee mark is, in essence, a "going-out-of-business" budget for Space Science, killing SIRTF plus effectively every future mission we have that is still in the planning stage, and more.
- Space Science has demonstrated excellent cost and schedule performance for the last 5 years. Most of our missions are being launched on time, and on (or under) budget. NO recent Space Science missions have experienced overruns of more than a few percent.
- Space Science has a broad, innovative, and effective Education and Public Outreach program that is reaching the public, including (especially) children, with the excitement of science. It was no fluke that the Mars Pathfinder website received 45 million hits per day in July 1997. Our missions and findings receive constant national media exposure.

Full Committee restores $400M to NASA on 7/30



- **Terminates the $400M originally provided for the Americorps program and adds the funding back for Space Science**
  - $100 million would go to the SIRTF
  - Future Mars mission spending would be restored at $75 million
  - $140M restored for Space Science technology
    - NGST, SIM, ST-3, ST-5, Europa Orbiter
  - $85 restored to Space Science Research programs
- **"While restoring $400 million of the funding that had been cut by the Subcommittee … it still leaves the Agency (and Space Science in particular) far short of healthy. "**

Impact of House Appropriations Committee vote on NASA's Space Science



$M Cut	Target
60.0	Deep Impact & MESSENGER
50.0	CONTOUR terminates this Discovery comet mission, selected October 1997
60.0	Future Explorer

* Our "Faster-Better-Cheaper" physics and astronomy missions. The total FY 2000 Explorer budget request was already 20% below FY 91-98 levels ($105 vs. $130 million FY 99 constant dollars).

* We are about to announce the selection of our next MIDEX missions, and expect to release SMEX and UNEX announcements in the coming months; all of these activities would be terminated.

60.0 Technology

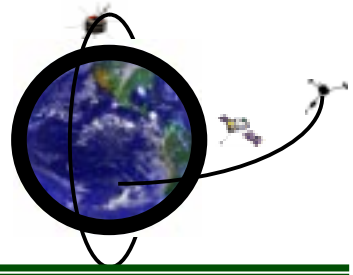
* Pluto Express, FIRST/Planck, GLAST, STEREO, Solar Probe, Solar-B ,

* This part of our budget supports mission studies and conquers the technological hurdles necessary to enable most of our future missions. Absorbing $60 million in cuts requires termination of all of the missions noted above, withering our scientific future, as laid out in our Strategic Plan.

35.0 Research

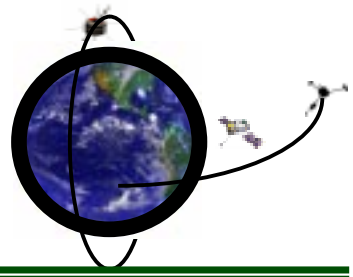
* This cut represents about 18% of our Research and Analysis budget, and is equivalent to eliminating nearly 600 grants of $60,000 (the approximate average grant size).

Cut to MISSION SUPPORT



- **From the House Subcommittee report, 7/26**
- **The appropriation provides for mission support, including: safety, reliability, and quality assurance activities supporting agency programs; space communication services for NASA programs; salaries and related expenses in support of research in NASA field installations; design, repair, rehabilitation, and modification of institutional facilities and construction of new institutional facilities; and other operational activities supporting the conduct of agency programs.**
- **The Committee recommends a total of $2,269M for the mission support account.**
  - The recommended amount is $242M below the fiscal year 1999 appropriation and $225M below the budget request.
  - In addition, given the programmatic changes directed in other NASA activities, personnel and related costs are reduced by $100M and research and operations support funding is reduced by $50M.
  - The Committee recommendation includes deferral of all Construction of Facilities projects, to be accomplished at some future date. This results in a budget reduction of $67M.

Watch your future unfold



- **NASA Office of Space Science**
  - http://www.hq.nasa.gov/office/oss/whatsnew.html
- **NASA Watch**
  - http://www.reston.com/nasa/watch.html
- **Florida Today**
  - http://www.flatoday.com/space/today/index.htm

RESOURCE ALLOCATION REVIEW BOARD

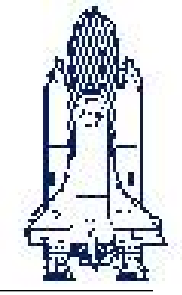
AUGUST 3, 1999

SPACE COMMUNICATIONS

JAMES A. COSTRELL

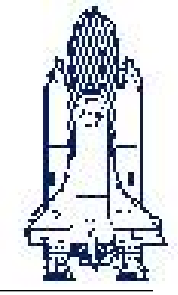
OFFICE OF SPACE FLIGHT (SPACE COMMUNICATIONS)

OFFICE OF SPACE FLIGHT
CODE M
SPACE COMMUNICATIONS



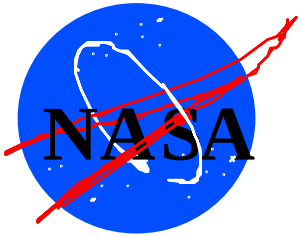
MAJOR PROGRAM PRIORITIES

- SUPPORT THE APPROVED MISSION SET (REQUIREMENTS)
    - DEVELOPED WITH THE ENTERPRISES AND THE SPACE OPERATIONS MANAGEMENT OFFICE (SOMO)
    - BASIS FOR BUDGET
    - SERVICE LEVEL AGREEMENTS ARE BEING DEVELOPED FOR ALL MISSIONS
- REDUCE THE COST OF SPACE OPERATIONS AND COMMUNICATIONS SERVICES
    - CONSOLIDATED SPACE OPERATIONS CONTRACT (CSOC)
    - MAINTAIN COMPATIBILITY WITH NATIONAL COOPERATIVE ARCHITECTURES
    - EMPHASIZE THE USE OF TECHNOLOGY - TECHNOLOGY ROADMAP
    - UTILIZE COMMERCIAL COMMUNICATIONS SERVICES
- SUSTAIN SPACE NETWORK CAPABILITY

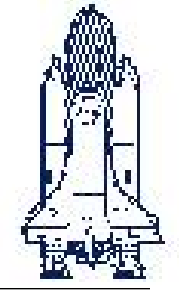


MAJOR PROGRAM PRIORITIES - CONTINUED

- ADVOCATE AND DEFEND SPECTRUM USE FOR NASA MISSIONS
- PARTICIPATE IN NATIONAL SPACE COMMUNICATIONS PROGRAM
    - INITIATED BY NASA AND NRO/DOD
    - FUTURE CONCEPT OF A NATIONAL SPACE RELAY
- INTERNATIONAL COOPERATION AND INTEROPERABILITY
- ADVOCATE COMMUNICATIONS STANDARDS
- COMMERCIALIZATION
    - SUPPORT CONTINUED AVAILABILITY OF TDRSS C-BAND
    - MARKET AVAILABLE CAPACITY
    - UTILIZE COMMERCIALLY AVAILABLE SERVICES

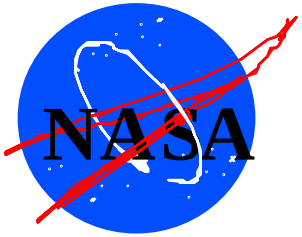


OFFICE OF SPACE FLIGHT
CODE M
SPACE COMMUNICATIONS

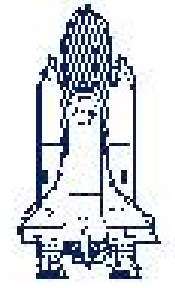


SPACE COMMUNICATIONS ISSUES

- CSOC
  - CONTRACT TRANSITION
  - WORKFORCE MANAGEMENT
  - BUDGET ENVIRONMENT
- DSN CAPABILITY - FUTURE MISSION MODEL
- TDRS REPLENISHMENT SPACECRAFT FIXED PRICE CONTRACT
- COMMERCIALIZATION
- Y2K

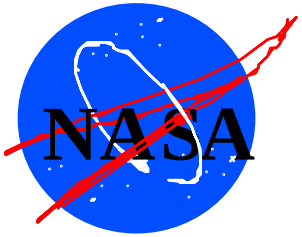


OFFICE OF SPACE FLIGHT
CODE M
SPACE COMMUNICATIONS

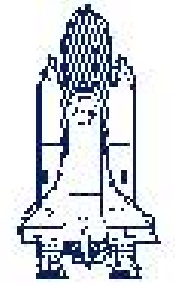


BUDGET CONCERNS/THRUSTS

- **SEVERE BUDGET REDUCTIONS**
- **ALLOCATION OF ENTERPRISE FUNDING TO SOMO BUDGET HAS BEEN AN ISSUE**
- **PRIORITIZATION REORDERING HAS BENEFITTED TECHNOLOGY**
- **NASA FY 2001 BUDGET SUBMISSION TO OMB SEPTEMBER 14**

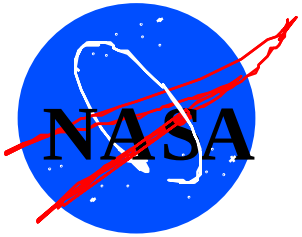


OFFICE OF SPACE FLIGHT
CODE M
SPACE COMMUNICATIONS

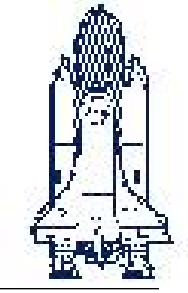


INTERAGENCY STRATEGIC PLANNING

- SPACE COMMUNICATIONS ANNUAL STRATEGIC PLANNING MEETINGS WITH FOREIGN SPACE AGENCIES
- ITCOP: INTERAGENCY TRACKING, COMMUNICATIONS, AND OPERATIONS PANEL
- ITCOPS IN 1999: ASI, CNES, ESA, NASDA
- MAJOR TOPICS
  - INTEROPERABILITY
  - NASA BUSINESS PRACTICES
  - CSOC
  - NASA COMMERCIALIZATION PLANS
  - NASA USE OF FOREIGN SPACE AGENCY ASSETS
  - FUTURE MISSIONS (COLLABORATIVE, REIMBURSABLE)
  - NETWORKS STATUS
  - SARDINIA



OFFICE OF SPACE FLIGHT
CODE M
SPACE COMMUNICATIONS

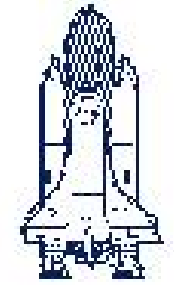


INTEROPERABILITY PLENARY

- **MULTI-AGENCY REVIEW OF IMPLEMENTATION STATUS AND PLANS OF INTERNATIONAL INTEROPERABILITY STANDARDS FOR EACH AGENCY'S SPACE COMMUNICATIONS ASSETS**

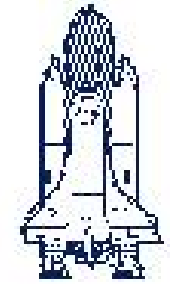
- **PARTICIPANTS: ASI, CNES, DLR, ESA, ISAS, NASDA, NASA**

NASA - GSFC
JPL
HQ - CODES M, S, Y
CSOC



INTEROPERABILITY PLENARY (CONTINUED)

- **CONSENSUS REACHED THAT:**
  - **ALL AGENCIES ARE COMMITTED IN PRINCIPLE TO ACHIEVING INTEROPERABILITY**
  - **PACE OF EACH AGENCY FOR IMPLEMENTATION OF INTERNATIONALLY RECOMMENDED STANDARDS IS LARGELY INFLUENCED BY MISSION NEEDS AND BUDGETS**
  - **A PRAGMATIC APPROACH IS TO PROCEED INCREMENTALLY DOWN A PATH THAT ALLOWS TECHNOLOGY INFUSION**

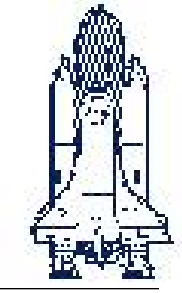


INTEROPERABILITY PLENARY (CONTINUED)

- IMPLEMENTATION COSTS CAN BE REDUCED BY THE SHARING OF DEVELOPMENT COSTS AMONG AGENCIES

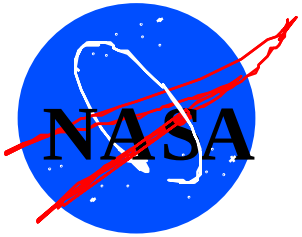
- AN INTERAGENCY STEERING/ADVISORY GROUP IS NEEDED TO PERIODICALLY OVERSEE AND STEER THE IMPLEMENTATION PATHS THAT THE MEMBER AGENCIES ARE TAKING

- NASA TO INITIATE THE CHARTERING OF THIS GROUP

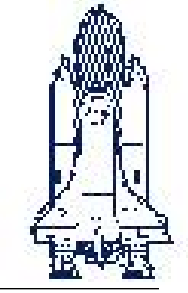


NASA OVERSEAS REPRESENTATIVES

- **NEW NASA REP IN SPAIN: INGRID DESILVESTRE**

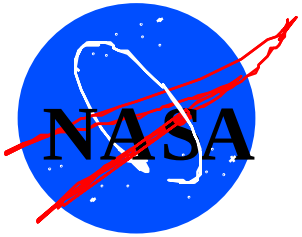


OFFICE OF SPACE FLIGHT
CODE M
SPACE COMMUNICATIONS

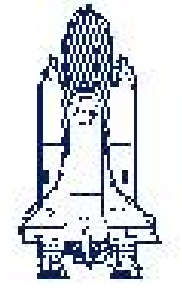


NORWAY TRACKING STATION

- NEW NASA TRACKING STATION AT SVALBARD, NORWAY
- LATITUDE - 78 DEGREES NORTH
- STATION INSTALLED FOR EARTH SCIENCE MISSIONS
- SVALBARD STARTED OPERATIONS IN APRIL
- CURRENT MISSIONS SUPPORTED
  - LANDSAT-7
  - QUIKSCAT
- FUTURE MISSION SUPPORT
  - TERRA
  - EO-1
- NORWEGIAN SPACE CENTRE OPERATES SVALBARD FOR NASA



OFFICE OF SPACE FLIGHT
CODE M
SPACE COMMUNICATIONS



SPECTRUM ISSUES

- **NTIA PRESSURE TO HAVE NASA MOVE FROM KU-BAND**

SOMO Mission Services Status
Briefing to JPL Resource Allocation Review Board

August 3, 1999

John Dalton

SOMO Mission Services Manager

GSFC Code 720

(301) 286-5713

john.dalton@gsfc.nasa.gov

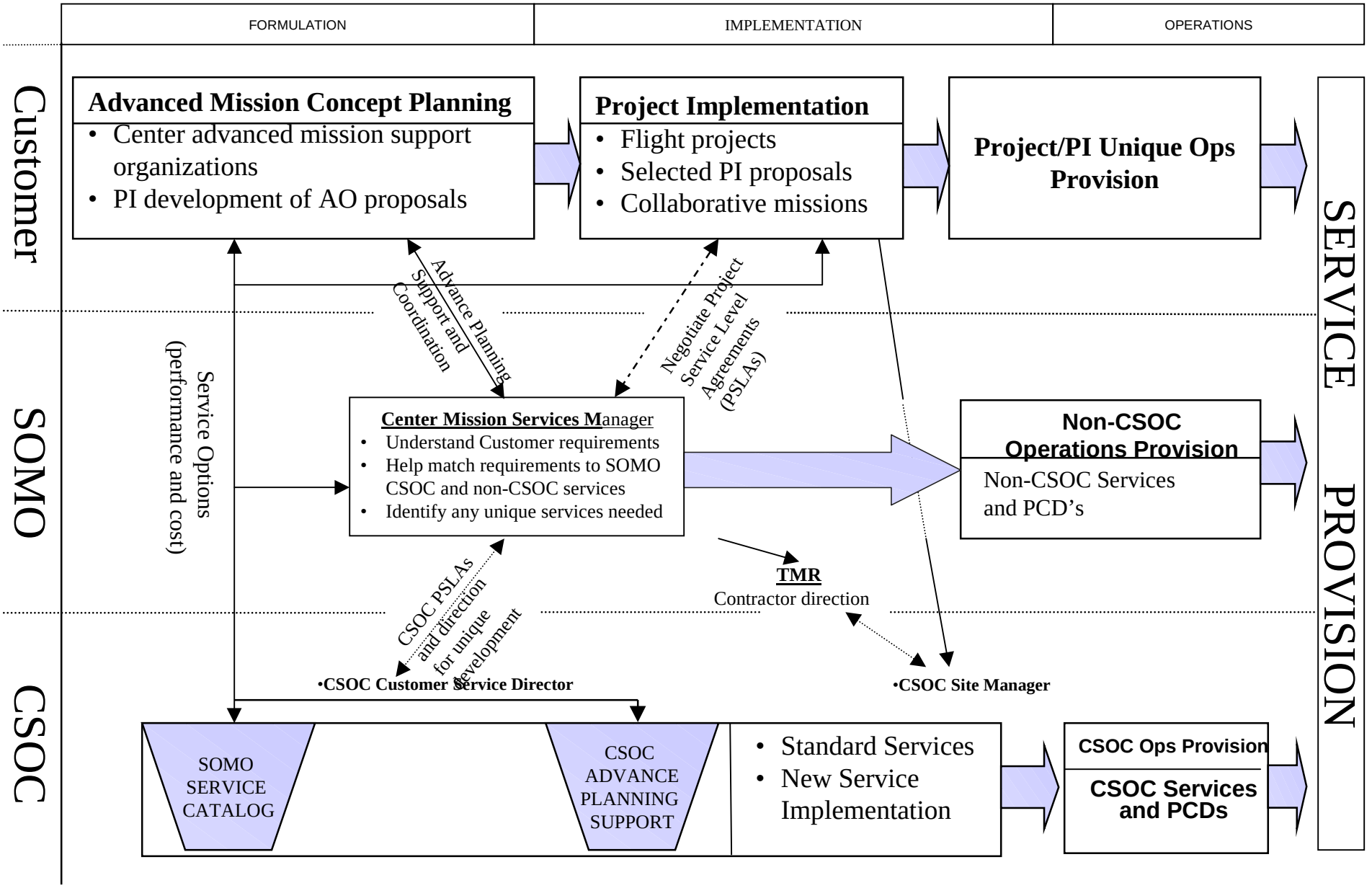
Status to be Addressed

- **Customer Commitment Process**
- **Services Catalog**
- **Pricing of SOMO Services**
- **Reviews of PSLAs with Mission Organizations**

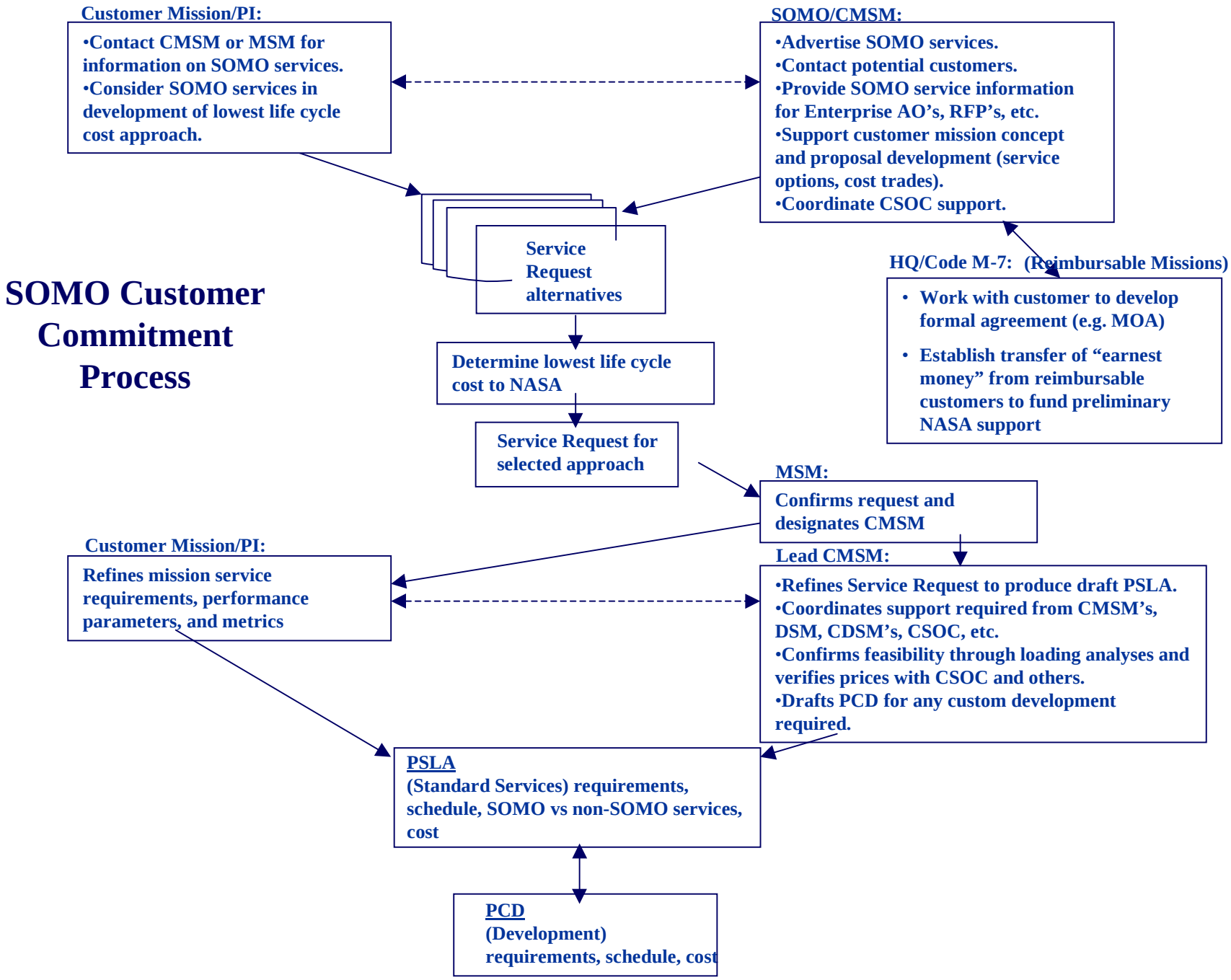
Customer Commitment Process

- **Process for working with missions to establish requirements and service prices has been baselined by SOMO Space Operations Control Board**
  - **ISO document 720-PG-1310.1.1**
  - **Flexible process for working with missions early in concept development and to support evaluation of services and costs for alternative flight/ground trades**
  - **Encourages early comparison of any non-SOMO solutions to find lowest life-cycle cost to NASA before specific path is chosen**
  - **Results in development of Project Service Level Agreement (PSLA) defining:**
    - » **service requirements**
    - » **any non-SOMO elements of the mission operations architecture**
    - » **Mission and SOMO funding commitments**
- **PSLAs have been drafted for all missions that are operational or in development**

SOMO/CSOC Mission Support Life Cycle



SOMO Customer Commitment Process



Services Catalog

- **Describes standard SOMO services (CSOC and non-CSOC)**
- **Identifies service prices in terms of unit cost (e.g., cost per minute of DSN 70 m. data acquisition)**
- **Status:**
  - **Preliminary text description in review. Scheduled for submission to SOMO for approval August 23.**
  - **Service prices have been incorporated into a PSLA matrix showing # of units and total cost for all services required by each mission**
    - » **Single price for DSN service weighted between cost for CS˚OC-managed Goldstone site and JPL costs for Canberra and Madrid**
  - **Known problems exist in definition of some services and units**
    - » **Some units are not directly related to cost; e.g., Level 0 processing services quantified in terms of # of products, without regard to size of product**
    - » **"One size fits all" approach does not always work for all services**
    - » **Definitions of services and units are being reviewed, with potential changes in units, subdivision of a service into levels of performance for different scale missions**

SOMO Service Categories

SOMO SERVICE CATEGORY	DESCRIPTION
Mission Planning	Trajectory and mission design, launch analysis, science instrument planning.
Sequence Engineering	Uplink process and sequence design, S/C operations schedule, event prediction.
Mission Control	Monitors spacecraft health and safety and sends corrective commands.
Instrument Control	Monitors specific spacecraft instruments, sends corrective commands.
Flight Engineering	Performance analysis and anomaly detection of instrument and S/C systems.
Tracking and Navigation	Radiometric data capture and generation of high order navigation products.
S/C Time Correlation	Monitors spacecraft clock drift and correlates time to a standard time reference.
Command	RF modulation, transmission, and delivery of telecommands to spacecraft.
Telemetry	Telemetry data capture and additional value-added data routing and processing.
Telecom Analysis	Spacecraft link performance, analysis, and prediction.
Mission Data Management	Data buffering, staging, storing, and archiving.
Experiment Data Products	Higher level data processing providing photo and science visualization products.
Ground Communications	Data, voice, and video communications network services.
Radio Science	S/C Doppler, range, and open-loop receiver measurements at 2, 8, and 32 GHz.
VLBI	Capture of narrowband or wideband very long baseline interferometric data.
Radio Astronomy	Similar to Radio Science except measures natural phenomena.
Service Management	Planning, scheduling controlling, configuring and accounting of system resources.

Service Costs

- **Services will be provided on a cost-per-unit service basis, e.g. cost per**
  - **Pass minutes/day for real-time operations**
  - **Level 0 product**
  - **Telemetry points per year for spacecraft performance and health**
- **Costs will be established and fixed on an annual basis**
  - **Any adjustments in charges due to changes in use of services will be reconciled annually**
  - **Prices will be based on a "factory model" of service costs, including**
    - » **Fixed costs of facility operations allocated across custormer missions**
    - » **Incremental costs of supporting an additional mission**
    - » **System capacity and upgrade costs**
- **Year-to-year variability in costs can result from a number of factors, including:**
  - **Changes in the mission set using SOMO services**
    - » **Allocation of fixed costs over more or fewer missions**
  - **Efficiencies in operations achieved through consolidation**
  - **Labor costs and inflation**

CSOC Integrated Operations Architecture (IOA)

- **Migrate GSFC, JPL, and JSC control centers to an Integrated Mission Operations Center (IMOC)**
  - **Not a single, integrated center**
  - **A scalable configuration of commercial software that can support multiple missions or be down-loaded to PI operations site**
  - **Initial plans for migration of active missions being revisited to assure net savings from any changes**
  - **GSFC planned to be first installation of IMOC**
- **Scheduling and operation of TDRSS, Deep Space Network, Low Earth Orbit Ground Stations, and Wide Area Networks to be consolidated at White Sands**
  - **NASA directed to commercialize Ground Network by 2002**
- **Consolidation of sustaining engineering, maintenance, and logistics management in Houston, with local presence as needed**
- **Migrate Level 0 processing functions to data acquisition site**
- **Work with spacecraft developers to adopt internet protocol standards between space and ground**

CSOC IOA Status

- **Schedule:**
  - **GSFC IMOC deployment** — **2nd Qtr 2001**
  - **TDRS, Ground Stations,DSN Scheduling consolidated at White Sands** — **3rd Qtr 2001**
  - **JPL and JSC IMOC** — **4th Qtr 2002**
  - **Level 0 processing functions moved to data acq. Site** — **4th Qtr 2003**
  - **TDRSS and WFF operations automated** — **4th Qtr 2003**
- **Status:**
  - **Architecture framework reviewed by SOMO review board and Centers on March 11-12, 1998:**
    - » **IMOC issues: open architecture, new system capabilities since proposal was written, transition from s/c I&T phase, reassessment of first mission applications**
    - » **Space/ground link: use of IP for deep space communications**
- **Near-term IOA Schedule:**

	Subsystem Functional Design Review (SSFDR)	SOCB Approval
GSFC Integrated Mission Operations Center (IMOC)	August 26	Oct. 14
Data Services Management Center (DSMC)	August 26	Oct. 8
Antenna Simulator and Modeling System	August 26	Oct. 8

Review of PSLAs with Mission Organizations

- **Reviewing Services Catalog and draft PSLAs with individual customer projects to:**
  - **Identify corrections needed to requirements**
    - » **Needed in 8% of services across all GSFC missions**
  - **Identify issues in service costs**
    - » **Found in 10% of services across GSFC missions**
  - **Support priority decisions by NASA Enterprises by providing information on shortfalls between total cost of services required vs total funding (SOMO plus Enterprise)**

New Missions

- **Triana support from DSN:**
  - **Back-up support when not in view of Universal Space Network sites or when high gain antenna not pointing to Earth**
  - **Expect to need on-call critical command and data support from DSN during first 24 hours after launch and during maneuvers to reach L1 and once on station**
  - **Requirements will be better constrained as launch date and flight dynamics analysis knowledge improves**
- **Future missions:**
  - **Increased use of AO process by Codes S and Y for defining new missions and latitude given to PIs makes future planning of SOMO service requirements vs capacity even more challenging**
  - **Best approach is to work with PIs as early as possible in the mission concept development process**

RESOURCE ALLOCATION REVIEW

August 3, 1999

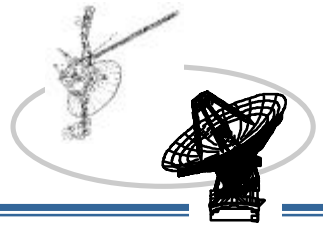
SOMO DATA SERVICES

&

DSMS OPERATIONS

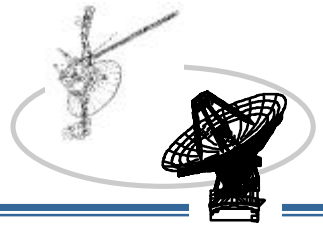
JPL

Dave Linick



Commercialization Activities

- **Primarily focussed on Ground Network (not DSN or TDRSS) to date**
  - **Triana**
  - **Support to Earth Polar Ground Network**
- **Potential Support for Deep-Space:**
  - **Ulysses southern hemisphere back-up**
  - **SIRTF launch support**



Commercialization Activities

- **Potential Support for Deep-Space (con't)**
  - **"Statements of Interest" solicited from CSOC**
  - **Government cost estimates also being developed**
- **Ulysses back-up support had been from Santiago**
  - **Santiago Also supported several GSFC missions**
- **SIRTF launch gap will be typical for Earth-trailing mission types**

Operations Office Organization (930)

JPL

As of 7/1/99

TMOD Operations Office (930)

D. Linick
J. Wackley, Deputy

CDSCC Rep:	**P. Churchill**
GDSCC Rep:	**D. Mischel**
MDSCC Rep:	**A. Chamarro**
CSOC Rep:	**I.T. Gillam**

Technical Staff

G. Spradlin	Chief Operations Engineer
A. Salazar	CSOC Technical Management Rep
B. Falin	Alternate CSOC Tech Mgmt Rep

Administrative Staff

C. Hillhouse	(OC)
M. Ardito	(Secy)
L. Cathey	(Secy)
M. Sawnor	(Secy)
A. Kim	(91) (Financial)
K. Phillips	(91) (Financial)

Resource Allocation Planning & Scheduling
G. Burke

Monitor & Control Services
J. Wackley
J. Hodder, Deputy

DSCC Facilities & Logistics
B. Falin

Network Infrastructure Services
R. Markley (36)

Antenna Maintenance
J. Osman (94)

Mission Services & Applications
R. Reichert (94)

Central Telecom Operations
S. Kurtik (94)

Tracking & Navigation Services
A. Cangahuala (94)

DSN Science Services
G. Resch (33)

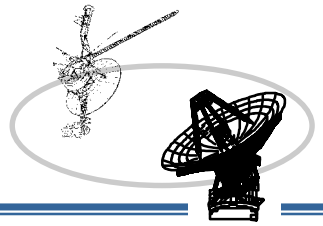
Science Instrument Services
L. Preheim (38)

Shared Appointment with TMOD Engineering Office (Pasadena Operations)

DSN Y2K TRANSITION STRATEGY

J. A. Hodder

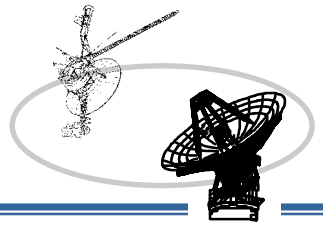
August 3, 1999



Introduction

We are proceeding to meet Y2K compliance requirements, and with the exception of a few items which will be ready later in the year, the systems are in the final certification process.

Deep Space Network Y2K Transition

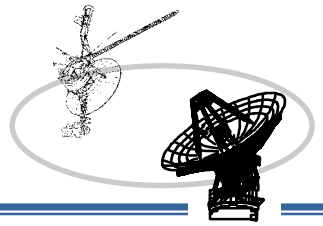


Staffing

Strategy

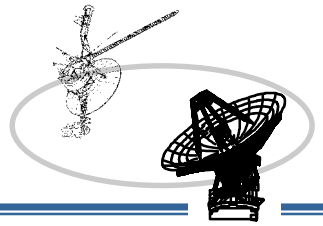
Timeline

Project participation



Staffing

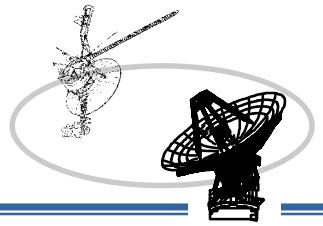
- **Tactical Team**
  - **The core team comprises a Team Leader, Coordinator, 3 Customer Service Representatives (CSR), 3 Network Operations Project Engineers (NOPE), and 3 Operations Systems Engineers.**
  - **DSCC operations crews will be augmented with subsystem engineers.**
  - **The NOCT will crew will be augmented with additional personnel.**



Staffing (cont.)

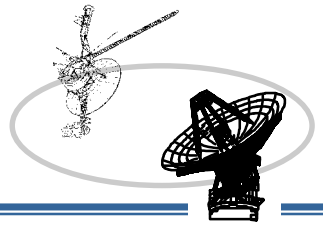
- **Tactical Team (cont.)**
  - **Other support personnel will be on call with a response time of less than 1 hour. These include Cognizant Design Engineers (CDE), support product specialists, and software library specialists.**

Deep Space Network Y2K Transition



Strategy

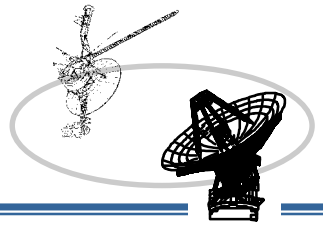
- **Pre-transition Preparations**
  - **The Tactical Team will conduct preparation meeting beginning several weeks prior to DOY 365.**
  - **The DSCCs will replenish all critical consumables, e.g. diesel fuel, prior to the transitions.**
  - **One week's worth of support products will be transmitted to the DSCCs prior to the transition.**



Strategy (cont.)

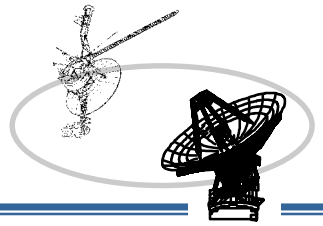
- **Local Transitions**
  - **Members of the Tactical Team will be on site.**
  - **Projects should schedule normal support, but should refrain from conducting critical activities.**
- **UTC Transition**
  - **The full Tactical Team will be on site.**
  - **With the Exception of emergencies, we will not support critical activities from DOY 365 at 1200 UTC to DOY 002 at 0000.**
  - **We will not support any activities from DOY 365 at 2330 UTC to DOY 001 at 0030 UTC.**

Deep Space Network Y2K Transition



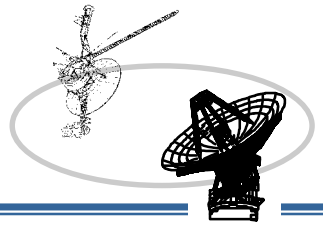
Strategy (cont.)

- **UTC Transition (cont.)**
  - **We will not support VLBI, radio science, or radio astronomy on DOY 001.**
  - **Goldstone and Canberra will transition to diesel generator power prior to the transition.**



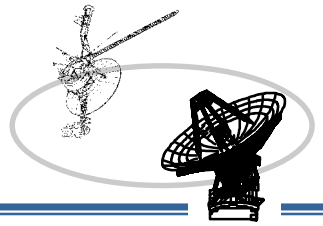
UTC Transition Timeline

- **Projects will begin terminating support approximately 2 hours prior to the transition, with all links free on or before 2330 UTC DOY 365.**
- **Goldstone and Canberra will transition to diesel generator power at 2330 UTC.**
- **Immediately following the transition the DSCCs will verify proper operation of the infrastructure. This includes power, HVAC, FTS, and voice and data line connectivity.**



UTC Transition Timeline (cont.)

- At transition plus 30 minutes SOA will begin for the first subnetwork.
- At each DSCC, the beginning of SOA for the next subnetwork will begin at BOT for the previous antenna at that complex.
- After all antennas have been returned to service, and commercial services have been validated as stable, Goldstone and Canberra will return to commercial power.

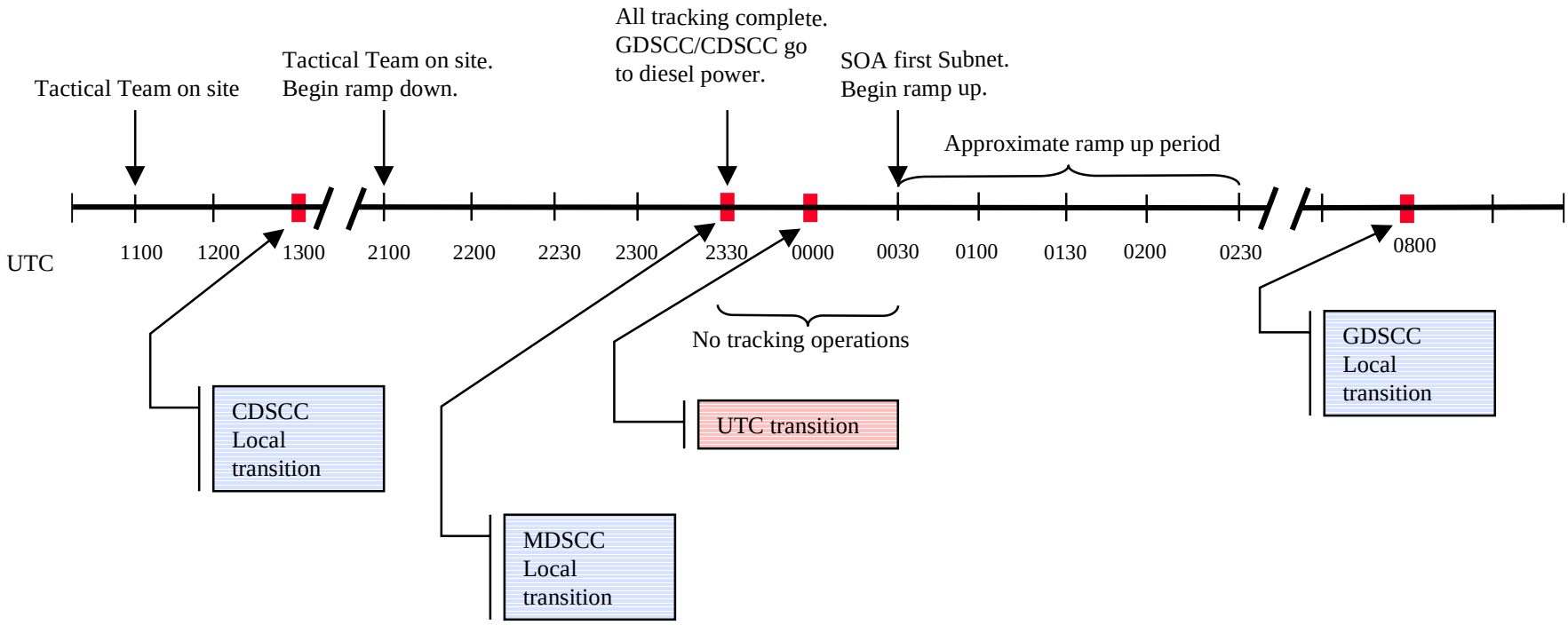


Project Participation

- **You should avoid planning critical events from DOY 364 at 1200 UTC to DOY 002 at 0000 UTC.**
- **You should collectively plan an orderly cessation of tracking prior to the UTC transition.**
- **We would appreciate assistance while validating your data deliverables, if your flight control team is available.**
- **If you produce a project timeline such as an SFOS, or similar plan, please provide a copy to your NOPE.**

Deep Space Network Y2K Transition

DOY 365 - 001 Transition Timeline



RESOURCE ALLOCATION REVIEW

3 August 1999

TMOD PLANS AND COMMITMENTS
PROGRAM OFFICE

JPL

DOUG GRIFFITH

NASA/JPL DEEP SPACE NETWORK
DSN Mission Set

CURRENT EARTH ORBITERS

HEO

- ACE
- CHANDRA
- IMAGE
- INTEGRAL
- ISTP-CLUSTER-II
- ISTP-GEOTAIL
- ISTP-POLAR
- ISTP-SOHO
- ISTP-WIND
- LUNA-A
- LUNAR-P
- VSOP (HALCA)
- STRV 1 c/d

LEOP

- ARTEMIS*
- NOAA L, M*
- QUICKSCAT
- FUSE
- GOES-L, M*
- TDRS H, I, J*
- DRTS-W*
- EUTELSAT W4*
- ASIASTAR *
- DELTA/GLOBALSTAR*
- SPACE STATION-ICM
- ACRIMSAT

LEGACY LEO'S

- ASCA
- RADARSAT
- YOHKOH

FUTURE - HEO

- SELENE ?
- NGST ?

FUTURE - LEOP

- ISS - ICM
- RADIOASTRON ?

FN: MSNSET07_99.PPT 6/10/99

** REIMBURSABLE* • *OPERATIONAL* *N (NEW)*

DEEP SPACE

CURRENT

- CASSINI ✓
- CONTOUR (D6)
- DS-1 (NEW MILLENNIUM)
- GALILEO ✓
- GENESIS (D5)
- GRAVITY PROBE B ✓
- MAP ✓
- MARS POLAR LANDER
- MARS CLIMATE ORBITER
- MGS
- NEAR
- PLANET B
- SIRTF
- SPACE VLBI ✓ (SCIENCE OBS)
- STARDUST
- ULYSSES
- VOYAGER 1, 2 ✓

FUTURE

- DEEP IMPACT (N)
- DISCOVERY 9, etc.
- DS-3 (ST-3)
- MARS EXPRESS
- MARS SURVEYOR 01 LDR
- MARS SURVEYOR 01 ORB
- MARS SURVEYOR(s) 03
- MARS SURVEYOR(s) 05
- MESSENGER (N)
- MIDEX 3, etc.
- MUSES-C
- NEW MILLENNIUM (FUTURE)
- OP/EUROPA
- OP/PLUTO
- OP/SOLAR PROBE
- ROSETTA
- SIM
- STEREO (N)

SPECIAL ACTIVITIES

- GSSR ✓
- RASA ✓

• *OPERATIONAL* ✓*REQUIRES 70M ANTENNA*

TELECOMMUNICATIONS AND MISSION OPERATIONS

OLD 920 ORGANIZATION CHART

JPL

Effective 4/12/99

SOMO Center
Mission Services Manager
D. G. Griffith (AD)

Office 920
Plans & Commitments

R. B. Miller, Manager
D. G. Griffith, Dep. Manager

Mission Operations Systems

DS-1
P. Varghese, Mission Mgr
R. Benson, TMS Mgr
Mission Data System
A. Sacks Manager
Outer Planets / Solar Probe
J. Carraway Mission Operations Sys Manager
J. Stewart TMS Mgr

SIM
S. Dallas, Msn Manager (331) (AD)
J. Stewart TMS Mgr
Space Infrared Facility (SIRTF)
M. Ebersole, Flight Operations Sys Manager
P.Beyer TMS Mgr J. Kahr (393)
M. Deutsch (311) M. Tankenson (393)

Telecommunications & Mission Services Managers

V.I. Altunin	- RADIOASTRON (AD), 70m CoObsi, HALCA
A. I. Beers	- ULS, TOPEX, VGR
R. D. Benson	- ST-1, NMP, ST-3, ST-4 - NEAR, IMAGE, MAP, CONTOUR,
A. L. Berman	RADARSAT, ACE, FUSE - GALILEO, STRV, SIRTF, CHANDRA - ISTP, ISAS, NASDA
P. E. Beyer	-- CASSINI,
A. F. Chang	EARTH ORBITERS - (GSFC)
R. L. Gillette	
J. C. McKinney	- MARS PROGRAM, MSOP,
D. P. Holmes	- STARDUST, GENESIS, INTEGRAL
P. T. Poon	- RA, RADAR, CNES, DLR,
J. M. Stewart	- GP-B, - LUNA-P, JASON, QUICKSCAT, SIM SNOE, ROSAT, GAVRT,OP/SP,

Spectrum Management

T. Peng, JPL Spectrum Manager
D. A. Bathker, Spectrum Engineer

Data System Standards

M. MacMedan (311)

Resource Analysis

E. S. Burke (930)

Staff

C. A. Black, SOMO Staff Engr.
F. D. McLaughlin, Staff Engr.
E. M. Walsh, Prog. Admin.
L. M. McKinley (C) Staff Assistant
R. J. Buckmaster, Office Coordinator
J. N. Hoeptner, Secretary P/T
V. R. Nadjarian, Secretary
A. C. Schweiner (C) Secretary P/T
E. D. vonDelden, Secretary

921 TMOD Systems Engineering
W. S. Tai, Manager

J. Breidenthal
W. Hurd
V. Pollmeier (311)
R. Moulder MOS Engineering
G. Spradlin Ops Engineering (930)

922 Strategy Development
R. J. Cesarone, Manager

R. Hastrup (311)
D. Abraham (311)

924 DSN Science
M. J. Klein (720), Manager

V. I. Altunin, VLBI
T. B. Kuiper, (32)
M. A. Slade (331)

925 Future Missions Planning
W. L. Martin, Manager

A. I. Beers (AD)
A. L. Berman (AD)
R. B. Crow (On call)
G. K. Noreen
J. C. McKinney (AD)

AD = ADDITIONAL DUTY
P/T = PART TIME
T = TEMPORARY

R. B. MILLER, MANAGER _____ DATE _____

APPROVED

G. SQUIBB, DIRECTOR FOR TMO _____ DATE _____

TELECOMMUNICATIONS AND MISSION OPERATIONS

DRAFT 920 ORGANIZATION CHART

JPL

Effective 7/26/99

SOMO Center
Mission Services Manager
D. G. Griffith (AD)

Office 920
Plans & Commitments

R. B. Miller, Manager
D. G. Griffith, Dep. Manager

Spectrum Management

T. Peng, JPL Spectrum Manager
D. A. Bathker, Spectrum Engineer

Resource Analysis

E. S. Burke (930)

Telecommunications & Mission Services Managers

V.I. Altunin	- RADIOASTRON, 70m CoObsi, HALCA
A. I. Beers	- ULS, TOPEX, VGR, MMAPT
R. D. Benson	- DS-1, NMP, ST-3, DEEP IMPACT
A. L. Berman	- NEAR, IMAGE, MAP, CONTOUR, RADARSAT, ACE, STEREO, MESSENGER
P. E. Beyer	- GALILEO, STRV, SIRTF, CHANDRA
A. F. Chang	- ISTP, ISAS, NASDA
R. L. Gillette	- CASSINI, EARTH ORBITERS - (GSFC)
J. C. McKinney	- MARS PROGRAM, MSOP,
D. P. Holmes	- STARDUST, GENESIS, INTEGRAL, ROSETTA
P. T. Poon	- RA, RADAR, CNES, DLR, - GP-B, ARTEMIS, PROSEDS, GLOBALSTAR
J. M. Stewart	- LUNA-P, JASON, QUICKSCAT, SIM SNOE, GAVRT,OP/SP,

Staff

C. A. Black, SOMO Staff Engr.
F. D. McLaughlin, Staff Engr.
E. M. Walsh, Prog. Admin.
R. J. Buckmaster, Office Coordinator

J. N. Hoeptner, Secretary P/T
V. R. Nadjarian, Secretary
A. C. Schweiner Secretary
E. D. vonDelden, Secretary

922
Strategy Development
R. J. Cesarone, Manager

R. Hastrup (311)
D. Abraham (311)

924
DSN Science
M. J. Klein (720), Manager

V. I. Altunin, VLBI
T. B. Kuiper, (32)
M. A. Slade (331)

925
Future Missions Planning
W. L. Martin, Manager

A. I. Beers (AD)
A. L. Berman (AD)
R. B. Crow (On call)
G. K. Noreen
J. C. McKinney (AD)

AD = ADDITIONAL DUTY
P/T = PART TIME
T = TEMPORARY

R. B. MILLER, MANAGER _____ DATE _____

APPROVED
G. SQUIBB, DIRECTOR FOR TMO _____ DATE _____

Telecommunications & Mission Services Managers

MISSION SUPPORT ASSIGNMENTS

V.I. Altunin	**- RADIOASTRON, 70m CoObsi, HALCA**
A. I. Beers	**- ULS, TOPEX, VGR, MMAPT**
R. D. Benson	**- DS-1, NMP, ST-3, DEEP IMPACT**
A. L. Berman	**- NEAR, IMAGE, MAP, CONTOUR, RADARSAT, ACE, STEREO, MESSENGER**
P. E. Beyer	**- GALILEO, STRV, SIRTF, CHANDRA**
A. F. Chang	**- ISTP, ISAS, NASDA**
R. L. Gillette	**- CASSINI, EARTH ORBITERS - (GSFC)**
D. P. Holmes	**- STARDUST, GENESIS, INTEGRAL, ROSETTA**
J. C. McKinney	**- MARS PROGRAM, MSOP,**
P. T. Poon	**- RA, RADAR, CNES, DLR, - GP-B, ARTEMIS, PROSEDS, GLOBALSTAR**
J. M. Stewart	**- LUNA-P, JASON, QUICKSCAT, SIM SNOE, GAVRT,OP/SP,**

Updated 7/28/99

Resource Allocation Review Board
August 3, 1999

OFFICE 940 - ENGINEERING

JPL

K. R. Kimball

WHAT'S NEW?

- WHAT'S NEW
  - NETWORK CONTROL PROJECT
  - 26M ANTENNAS
  - UPDATE ON 11-M ANTENNAS
  - COMMAND UPGRADE AND UPLINK MODS
  - DOWNLINK CONSOLIDATION
  - OTHER SUPPORT CAPABILITIES
  - Y2K
- DOWNTIME SUMMARY
  - NEAR-TERM
  - LONG-TERM

WHAT'S NEW?

- **NETWORK CONTROL PROJECT**
  - **NPP TASK (NETWORK PLANNING AND PREPARATION)**
    - **TASK TERMINATED.**
    - **NO MISSION IMPACT. SPK TRANSLATORS WILL BE PROVIDED WHERE REQUIRED**
  - **NMC TASK (NETWORK MONITOR & CONTROL)**
    - **OPERATIONAL USE OF D1 DEFERRED DUE TO RELIABILITY PROBLEMS**
    - **NEW PLAN IS FOR D1.1 TO ENTER SOAK IN OCTOBER 99**
    - **BWG SUBNET WILL BE FIRST, FOLLOWED BY OTHERS ON APPROXIMATELY 1-MONTH CENTERS.**
    - **D1.2 WILL FOLLOW AS DELTA IMPROVEMENT IN APRIL 2000.**

WHAT'S NEW?

- 26M ANTENNA AUTOMATION
  - COMPLETION DEFERRED 3 MONTHS
    - GOLDSTONE COMPLETE IN MID-SEPTEMBER
  - NEW ANTENNA CONTROL SUBSYSTEM OPERATIONAL
    - AT GOLDSTONE AND MADRID
  - 1 REMAINING DOWNTIME FOR CANBERRA
    - 8/9 THRU 8/20/99 FOR ANTENNA CONTROL MODS

WHAT'S NEW?

- **UPDATE ON 11M ANTENNAS**
  - **PERFORMANCE: 92% 'GREEN' IN CY99**
  - **RADIOASTRON MOVED TO FUTURE MISSIONS LIST**
  - **CURRENT PLAN TO TERMINATE 11M OPERATIONS ON 12/31/00**
  - **IN JUNE 00, HEADQUARTERS WILL ASSESS EXTENSION OF HALCA MISSION**

WHAT'S NEW?

- COMMAND UPGRADE AND UPLINK MODS
  - ON SCHEDULE, AS A PARTNERSHIP WITH ATSC-COLUMBIA
  - FIRST OPERATIONAL USE DELAYED UNTIL MAY 00, DUE TO NMC DEPENDENCY
  - INTITIAL DELIVERY WILL PROVIDE CLTU SERVICE AND THROUGHPUT SERVICE
  - BLOCK V EXCITER INSTALLATIONS COMPLETED. FINAL TESTING UNDERWAY

WHAT'S NEW?

- **DOWNLINK CONSOLIDATION**
  - **DEVELOPMENT AND DEPLOYMENT PLAN ESTABLISHED**
  - **NEW IF SWITCHES DELIVERED FROM VENDOR**
  - **FINAL VENDOR SELECTION PENDING FOR NEW TELEMETRY PROCESSORS**
  - **FIRST OPERATIONAL USE IN 2003**

WHAT'S NEW?

- **OTHER KEY SUPPORT CAPABILITIES (NO CHANGES)**
  - **X-UP, Ka-DOWN AT 5 BWG ANTENNAS BY 2004**
  - **ARRAY CAPABILITY AT GDSCC BY OCTOBER 1999**
  - **DSS-26 OPERATIONAL BY SEPTEMBER 2003**
  - **CLOSE DSS-61 AND DSS-42 ON 12/15/99**

WHAT'S NEW?

- **Y2K STATUS**
  - CERTIFICATION OF 321 DSMS ITEMS NEARING COMPLETION
  - 276 HAVE BEEN CERTIFIED. REMAINDER BY 8/23, EXCEPT NSS:
    - LATE DECISION TO MODIFY NSS DUE TO NPP CANCELLATION
    - CSOC/ATSC TO COMPLETE IMPLEMENTATON BY 10/4/99
  - IMPLEMENTATION OF FIRST INSTANCES IS COMPLETE
    - 6 OF 51 DUPLICATE INSTANCES REMAIN TO BE INSTALLED(BY 8/6)

Summary of Near-term Downtime Needs and Schedule (8-1-99 to 2-1-00)

- 70m ME Encoder Replacement (DSS-63)
  - Master Equatorial angle encoder replacements, necessary for improved performance and maintainability. Scheduled for Sept 99 (DSS-14,43 completed).
- 70m Hydrostatic Bearing Regrout
  - Minor repair at DSS-43 in September
- 70m Microwave S/S Controller (CCG) Replacements (DSS-63)
  - Replacement of processor and control/monitor communications cabling. Downtime of 10 days is scheduled (14&43 completed).
- Block 5 Exciter Installations (complete)
  - Testing required prior to operational use (no downtime)
- 26m Automation (DSS-46) (16 & 66 completed)
  - DSS-46 downtime scheduled August 99

Summary of Long-term Downtime Needs and Schedule (after 2-1-00)

- **34m HEF Subreflector Drive Replacements (2 weeks per antenna)**
  - DSS-45 & 65 scheduled in 2000 (DSS-15 completed)
- **70m X-Band Uplink Modifications (9 weeks per antenna)**
  - Concurrent tasks: 70m Motor Control Center Repl, Azimuth Cablewrap Rehab, Counterweight Rebalance
  - Scheduled March-April 00 at DSS-14 (also do major bearing regrout)
  - Scheduled August-October 00 at DSS-43
  - Scheduled August-October 01 at DSS-63
- **70m Hydrostatic Bearing Replacement (16 weeks per antenna)**
  - 01 through 03. Not scheduled.
- **70m Servo Drive replacement (4 weeks per antenna)**
  - 01 through 02. Not scheduled.
- **26m Servo Drive replacement (4 weeks per antenna)**
  - 01 through 03. Not scheduled.

RESOURCE ALLOCATION REVIEW

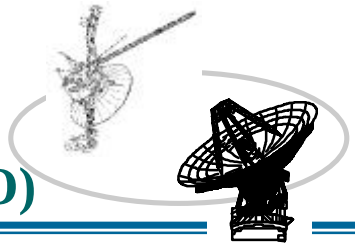
FORECAST METHODOLOGY

FOR

REDUCED NETWORK LOADING

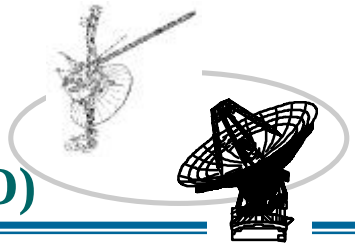
JPL

David Morris



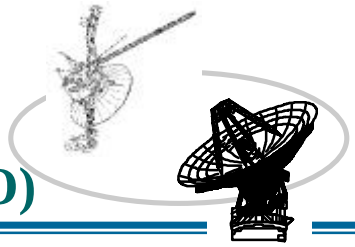
FORECAST METHODOLOGY for REDUCED NETWORK LOADING

- **Antenna Tracking Assets are Oversubscribed**
  - **Multiple Missions Need Full View Coverage**
    - **All Subnets have Contentions in 2000 and 2001**
  - **Twice per Week Meetings During Mid-Range Allocation**
  - **What are the Reasons?**
    - **Uncertainty**
      - **HEO Long-Term View Period Accuracy on 26 meter Subnet**
      - **Launch Changes Cause Extensive Rework**
      - **Mission Design Changes Due to New or Missed Opportunities**
    - **Maturing Requirements**
      - **Increased Science / Engineering Needs**
    - **Implementations Cause Antenna Downtime**



FORECAST METHODOLOGY for REDUCED NETWORK LOADING

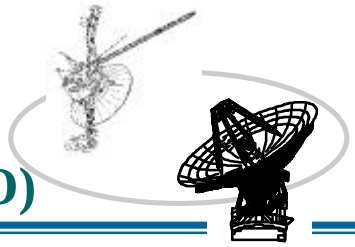
- **1999 - 2002 Summary:**
  - **Capacity or Capability Changes:**
    - **Retained 34 meter Standard Antennas at Madrid and Canberra until 12/17/1999**
    - **Implementation of X-Band Transmitters in 70 meter Subnet**
  - **Requirement Changes:**
    - **Reduction of Requirements from NEAR (1999) and Nozomi**
    - **Planned use of Multiple Spacecraft per Antenna (MSPA) for Missions at Mars**
  - **Forecast and Negotiation of Antenna Downtime and Testing**



FORECAST METHODOLOGY for REDUCED NETWORK LOADING

- **Overall Goal: Reduce Time in Scheduling the Network**
- **Current Proposed Remedies:**
  - **Multi-Party Mediation**
  - **Reduction of Forecasted Unsupportable Time to 0%**
  - **NASA HQ Guidance - Provide Science Perspective**

- **Multi-Party Mediation**
  - **Assess Mid-Range Allocation Process by Professional Mediators**
  - **Initial Assessment Would:**
    - **Involve Current Team Members**
    - **Determine Approach and Predict Likelihood of Success**



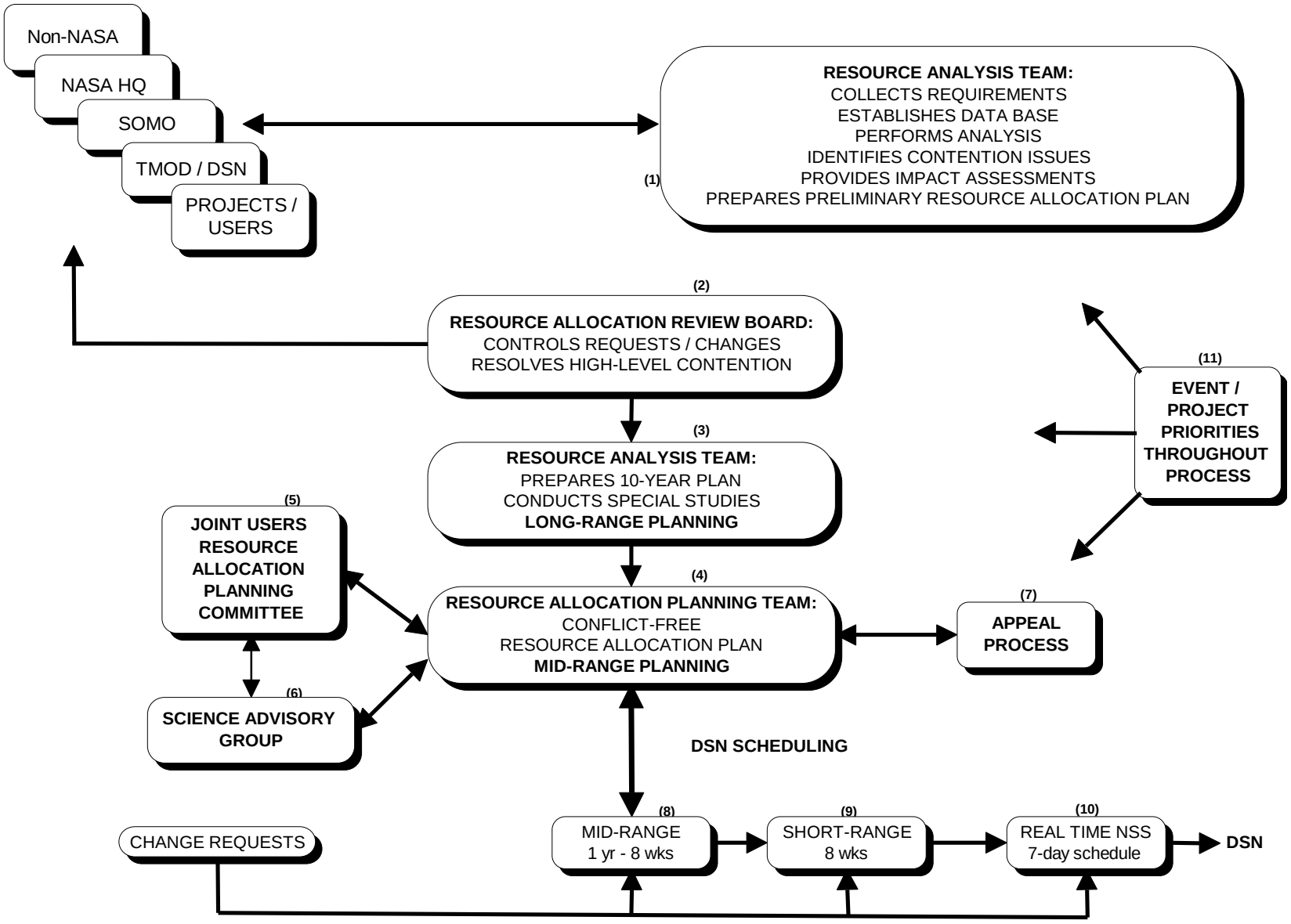
FORECAST METHODOLOGY for REDUCED NETWORK LOADING

- **Reduction of Forecasted Unsupportable Time to 0%**
  - **Requires Up-to-Date Mission Requirements**
    - **Working with Projects, SOMO and HQ for a Complete Set**
  - **Defining Additional Analysis Software to Reach This Goal**

- **NASA HQ Guidelines - Provide Science Perspective to Contentions**
  - **Discussions on Content and Priorities**
  - **Defining Analysis Software to Speed Identification of Candidate Contentions**

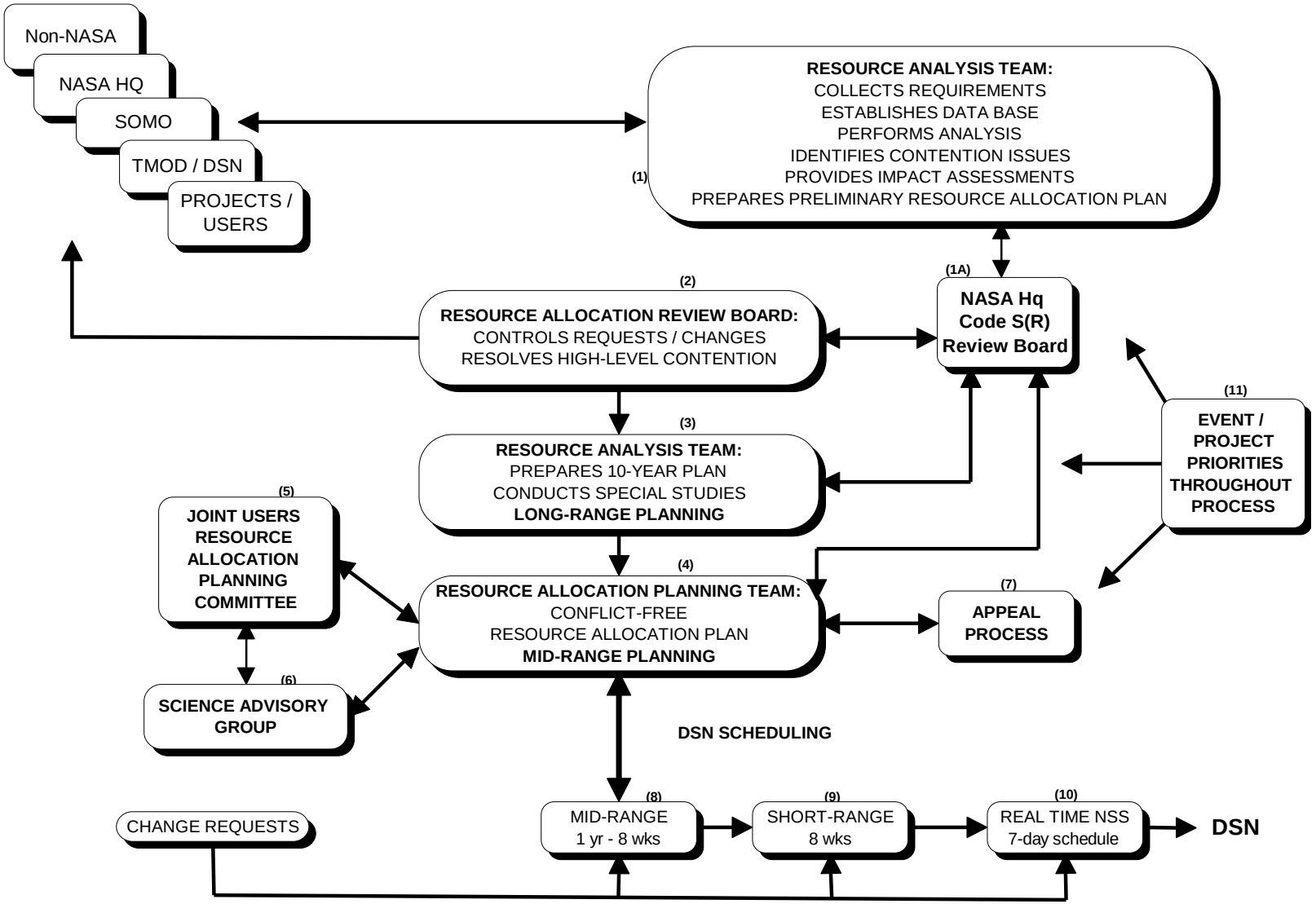
Resource Allocation Planning & Scheduling Office (RAPSO)

Current RAPSO Planning & Scheduling Process



Resource Allocation Planning & Scheduling Office (RAPSO)

PROPOSED RAPSO PROCESS



RESOURCE ALLOCATION REVIEW

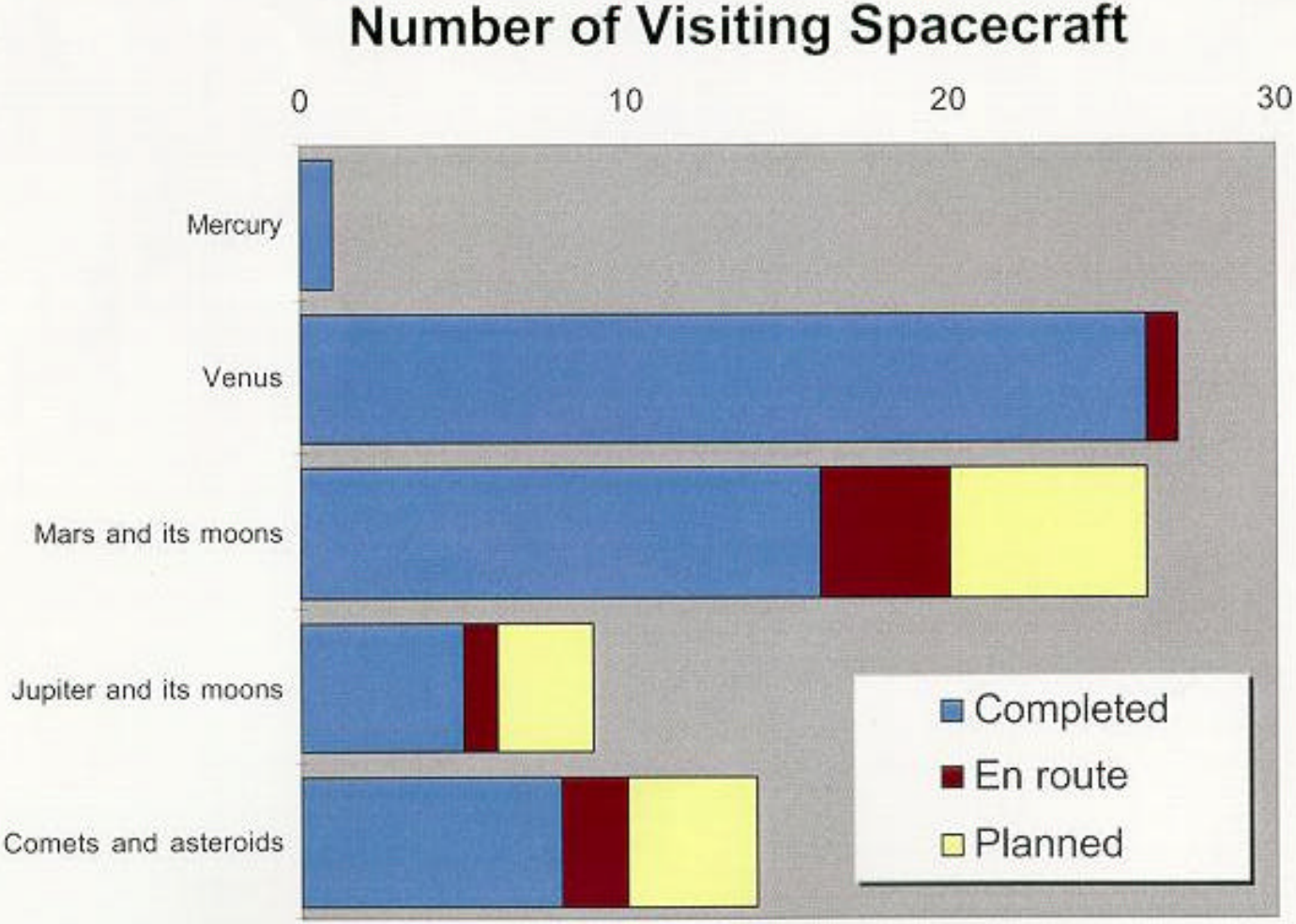
NEW and MODIFIED PROJECT REQUIREMENTS

MESSENGER

Johns Hopkins University Applied Physics Laboratory

Bob Farquhar

Mercury Offers Greatest Opportunity for Discovery



Nickel-hydrogen, dual-cell, battery pressure vessel

Leros 1b 645-N thruster

Forward low and medium-gain antennas

Thermal shade provides a room-temperature environment for the spacecraft.

XRS solar monitor

Forward sun sensors (4 places)

Forward phased array antenna

22-N bipropellent thruster (4 places)

EPPS instrument

Star tracker (2 places)

Battery

Side radiator panel

Solar array drive

Aft sun sensor

Aft low-gain/medium-gain antennas

4.4-N thrusters (10 places)

Aft phased array antenna

Launch vehicle adapter ring

MAG instrument with mini thermal shade

Full-scale brassboard phased array (two places) used for high-gain downlink.

Spacecraft Inflight Configuration

99-0962
Farquhar

MESSENGER Science Payload

- Mercury Dual Imaging System (MDIS)
- Gamma-Ray and Neutron Spectrometer (GRNS)
- Magnetometer (MAG)
- Mercury Laser Altimeter (MLA)
- Atmospheric and Surface Composition Spectrometer (ASCS)
- Energetic Particle and Plasma Spectrometer (EPPS)
- X-ray Spectrometer (XRS)
- Radio Science (RS) uses telecommunication system

Measurement Requirements Are Met

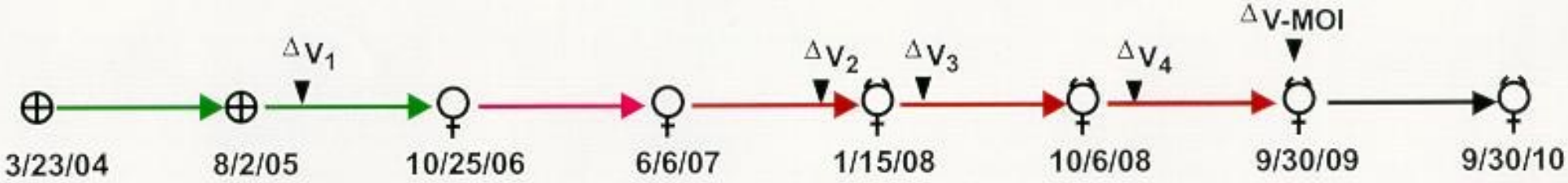
MESSENGER Objectives	Science Measurement Objectives
Map the elemental and mineralogical composition of Mercury's surface	**GRNS**: Surface elemental abundances
	XRS: Surface elemental abundances
	ASCS/VIRS: Surface mineralogy
Image globally the surface at a resolution of hundreds of meters or better	**XRS:** Abundances of Fe, Mg, Ca, Al, Si, Ti,S **GRNS:** K, U, Th, Fe, Si, O, H
	MDIS: Images @ 250 m/pixel, selected areas @ 10 m/pixel
	Altimetry Crustal and tectonic structures, volcanic morphology **MLA**: N-hemisphere topography, ground truth to stereo
Determine the structure of the planet's magnetic field	**MAG**: Comprehensive magnetic field measurements
	EPPS: Magnetospheric species
Measure the libration amplitude and gravitational field structure	**RS + MLA**: Gravity field, occultation radii, libration amplitude
Determine the composition of the radar-reflective materials at Mercury's poles	**GRNS**: H, S detection at poles (if present)
	MLA: Profiles over craters containing frozen volatiles
	ASCS/UVVS: Atmospheric composition over polar regions
	EPPS: Detection of H or S enrichment over polar regions
	ASCS/UVVS: Spectral measurements of atmosphere
Characterize exosphere neutrals and accelerated magnetosphere ions	**GRNS, XRS**: Elemental composition of surface
	EPPS: Composition of magnetospheric ions and pickup ions

Robust Launch-Window Strategy

- Launch opportunities *
  - March 23 – April 6, 2004 (15 days)
  - August 2 – 16, 2004 (15 days)
- Launch-energy requirement: $C_3 = 16.0\ Km^2/sec^2$
- Launch vehicle: Delta – 7925H – 9.5
- Allowable spacecraft launch weight: $M_0 = 1066$ Kg (99% PCS, 3712C PAF)

* A further opportunity in August 2005 also exists

Mission Timeline



Solar Distance

Maximum: 1.11 AU
Minimum: 0.30 AU

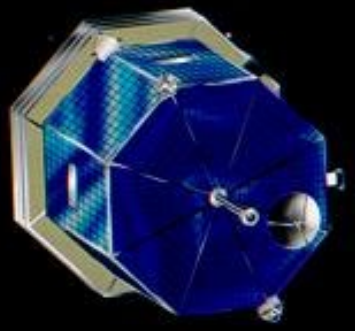
Deep Space Maneuvers

ΔV_1 = 291 m/sec (12/21/05)
ΔV_2 = 249 m/sec (10/27/07)
ΔV_3 = 73 m/sec (03/19/08)
ΔV_4 = 239 m/sec (12/06/08)

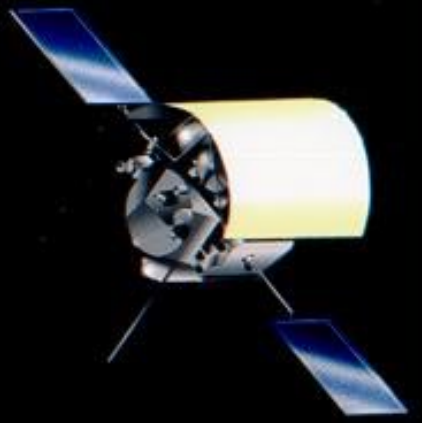
⊕ Earth
♀ Venus
☿ Mercury
MOI Mercury Orbit Insertion

Table F-6-1 DSN Usage

Major Events	34 m (HEF/BWG)	70 m
Launch phase	L+5 days, continuous (100% BWG)	0
Cruise phase (nominal)	Two 4-hr pass/wk (26% HEF, 74% BWG)	0
Flyby nav: Earth, Venus (2), Mercury (2); orbit insertion	E-2 to E+2 wks 8 hrs/day (100% BWG)	Two 8-hr passes per event
Mercury flyby science return	0	9 days, 8 hrs/day
Mercury orbit phase	8 hrs/ day (63% HEF, 37% BWG)	0
TOTAL HOURS	**3712 HEF, 3390 BWG**	**168**



CONTOUR/MESSENGER



11/12/03 Encke
6/18/06 SW3
8/16/08 d'Arrest
8/13/02 Injection (I)
8/13/03
8/13/04
2/9/05
2/9/06
2/9/07
2/10/08
Year 2002
2003
2004
2005
2006
2007
2008
2009
Launch
I + 65d
2004
2005
2006
2007
2008
2009
2010
2011
3/23/04 Launch
8/2/05
10/25/06
6/6/07
1/15/08
10/6/08
9/30/09
9/30/10
ΔV1 12/21/05
ΔV2 10/27/07
ΔV3 3/19/08
ΔV4 12/6/08
Mission Operations High Activity Time
CONTOUR
MESSENGER
MESSENGER/Mercury Orbital Phase
99-0964

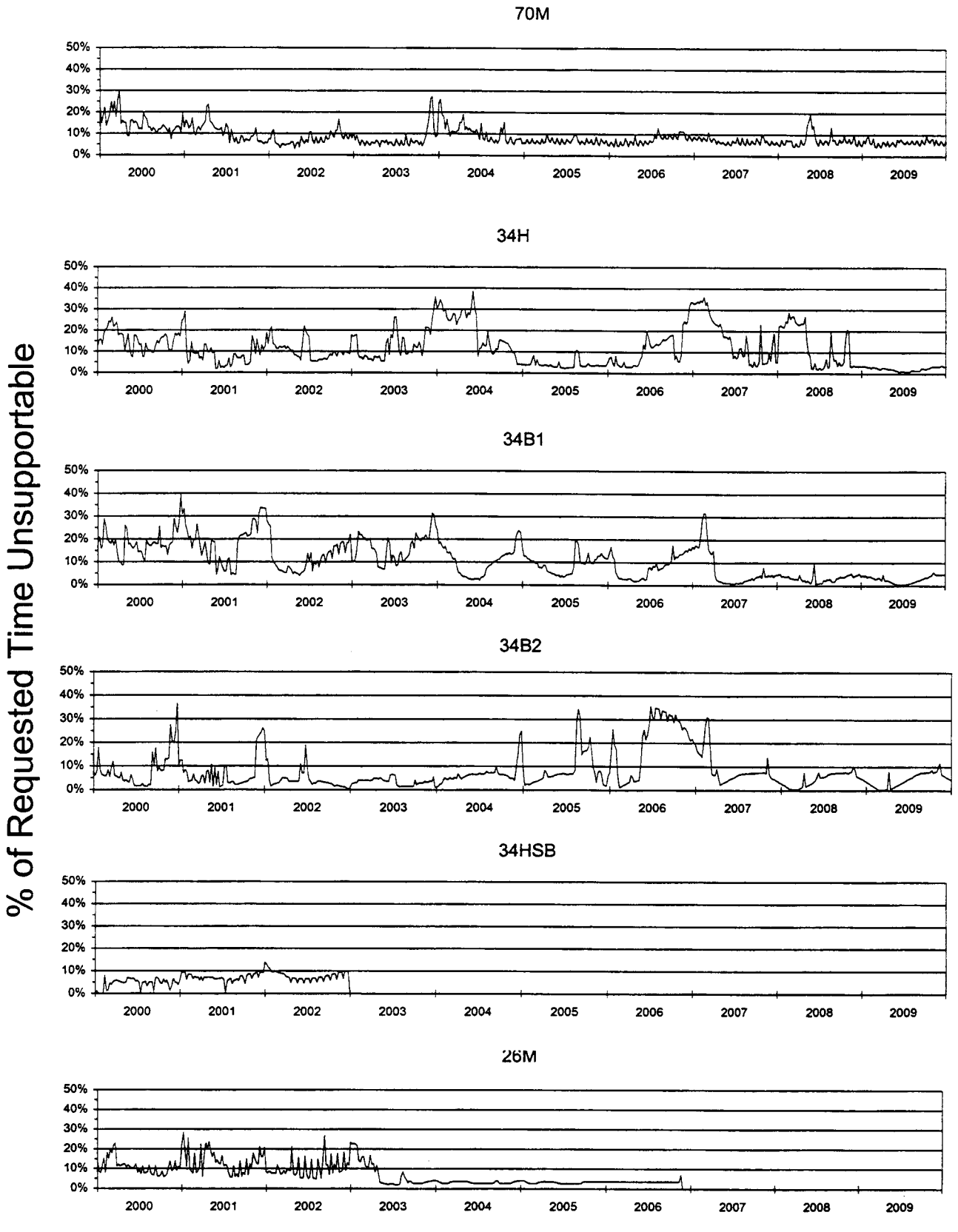
RESOURCE ALLOCATION REVIEW

RESOURCE CONTENTION SUMMARY

JPL

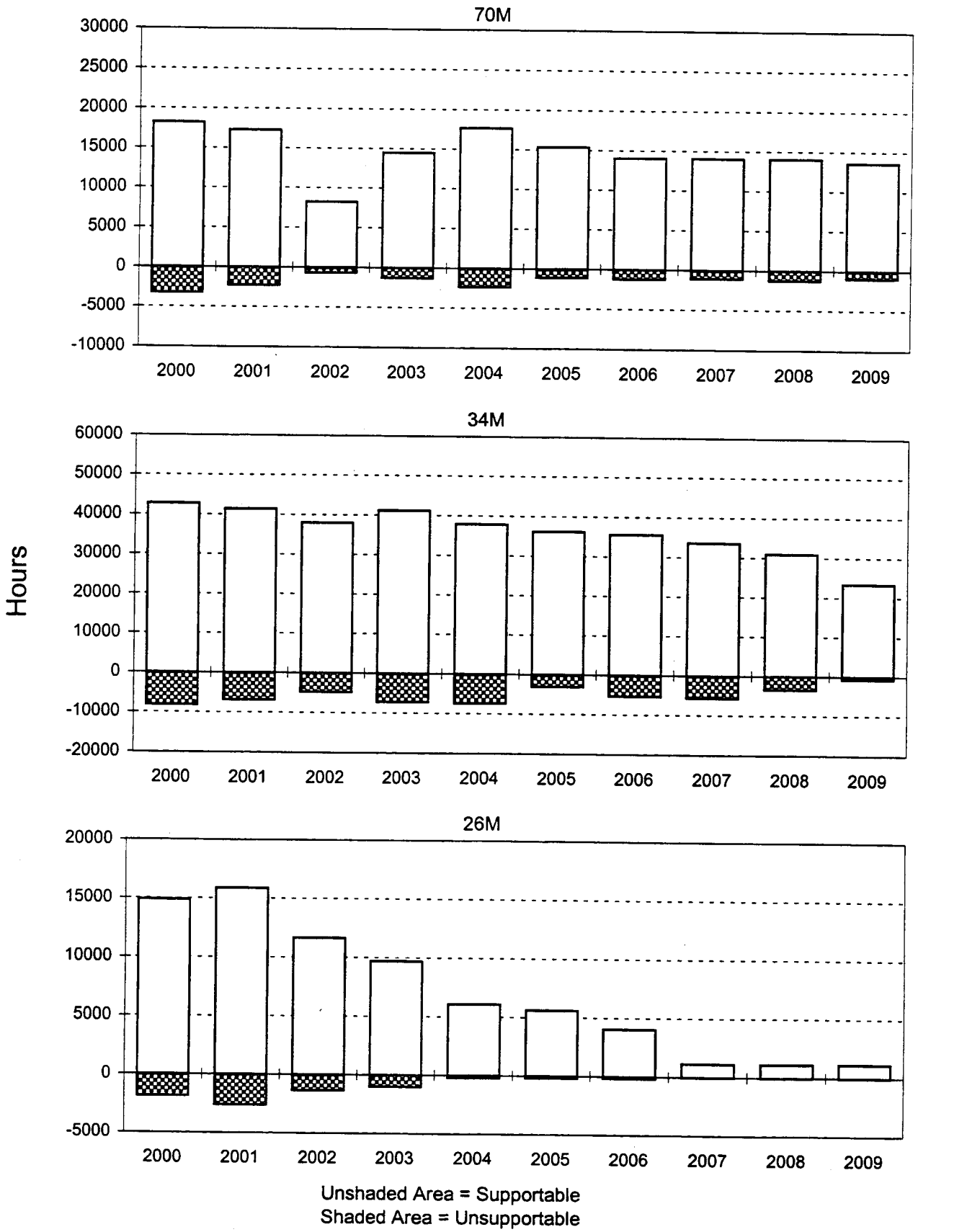
Gene Burke

Projected Lost Time Summary



$$\text{Projected Lost Time} = \frac{\text{Expected Lost Time}}{\text{Total Requested Resource Usage Time}}$$

Projected Yearly Supportable Time Summary
2000 - 2009



Unshaded Area = Supportable
Shaded Area = Unsupportable

Prepared by RAP
7/27/99 4:32 PM

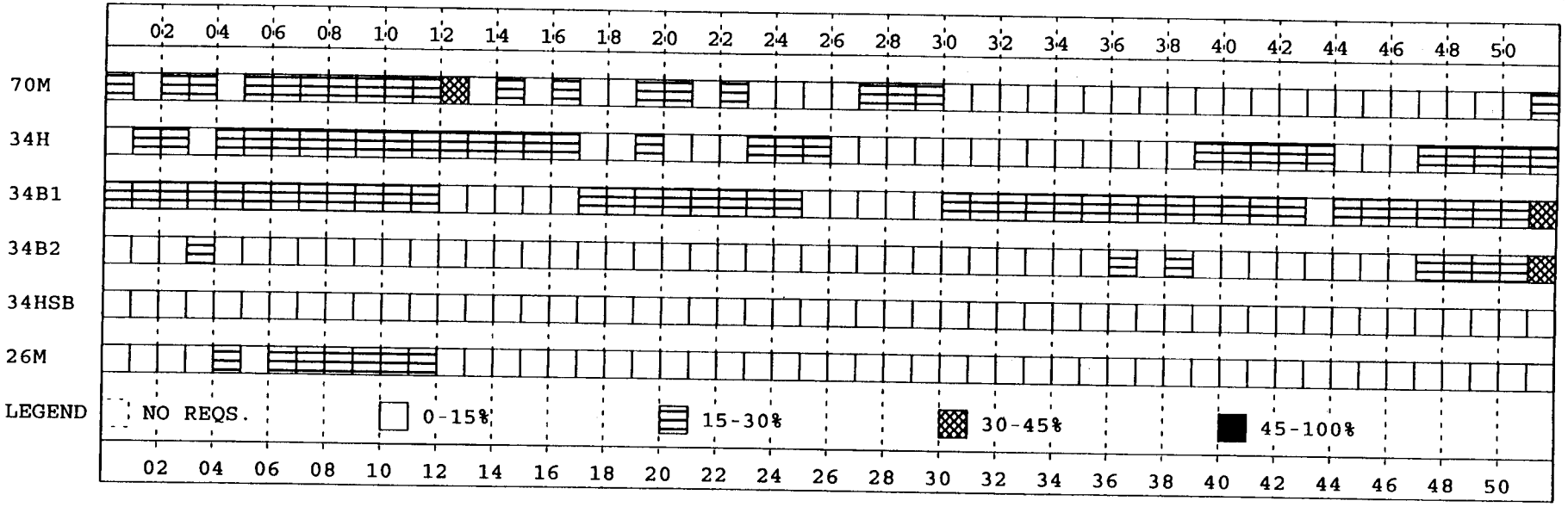
Figure 2

10yrrsrc.xls
70M, 34M & 26M Subnet Chart

User: DMORRIS/Server: JPL-RAP

Tue Jul 27 16:37:39 1999

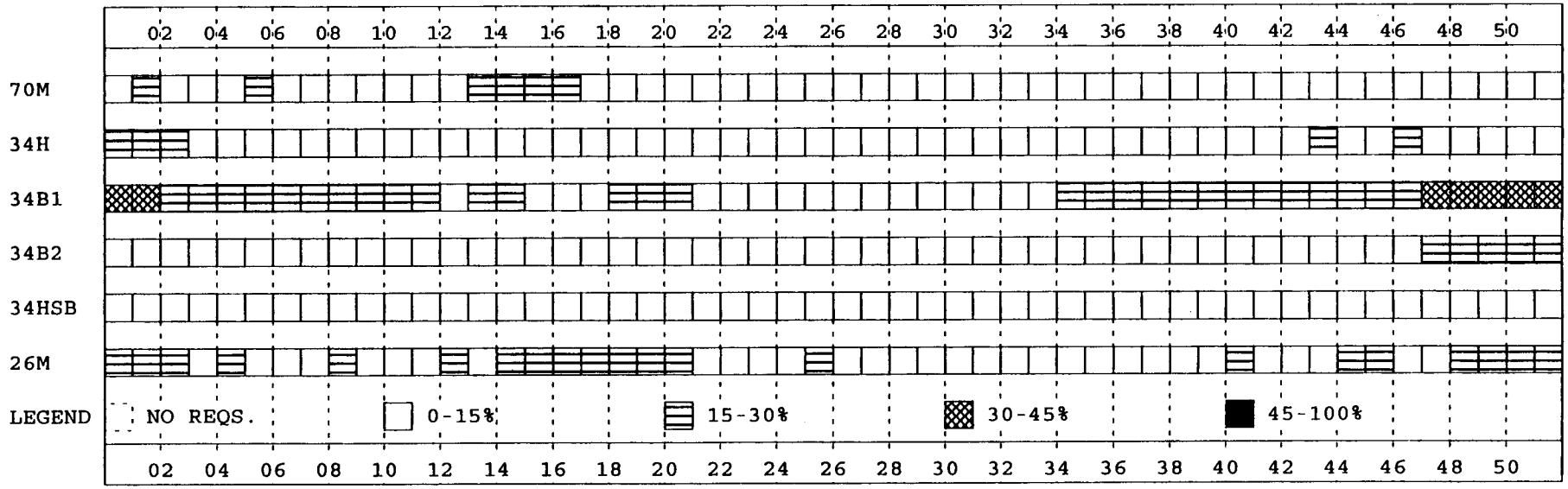
2000 DSN Subnet Contention



User: DMORRIS/Server: JPL-RAP

Tue Jul 27 16:36:53 1999

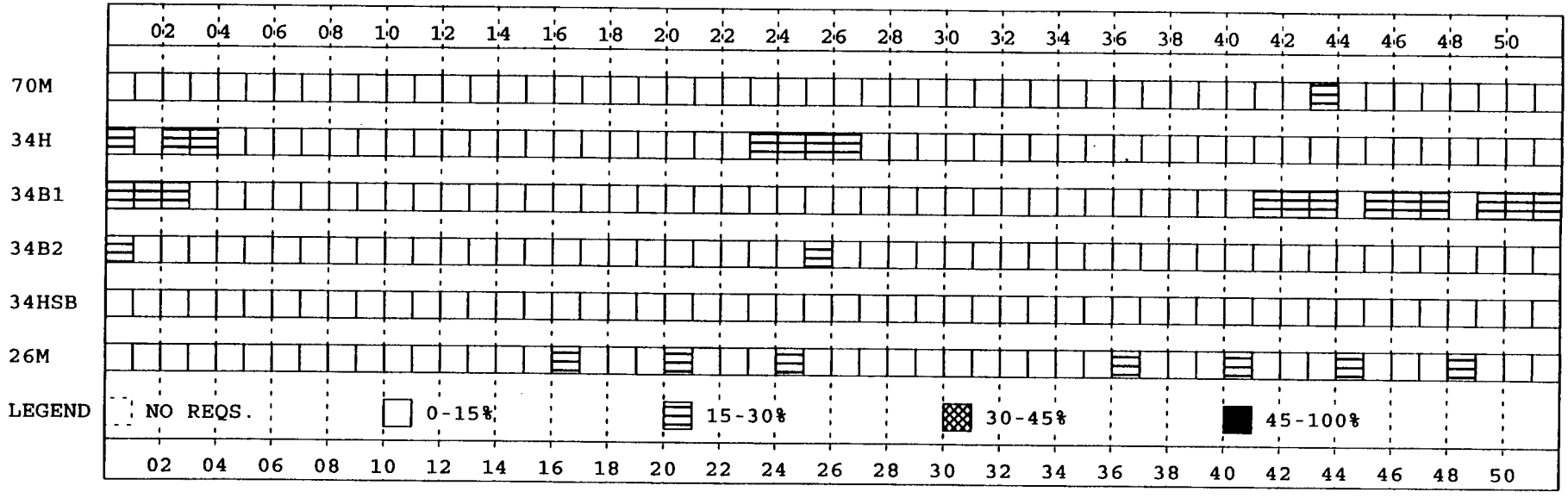
2001 DSN Subnet Contention



User: DMORRIS/Server: JPL-RAP

Tue Jul 27 16:36:08 1999

2002 DSN Subnet Contention



JPL

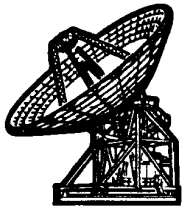
Resource Allocation Review

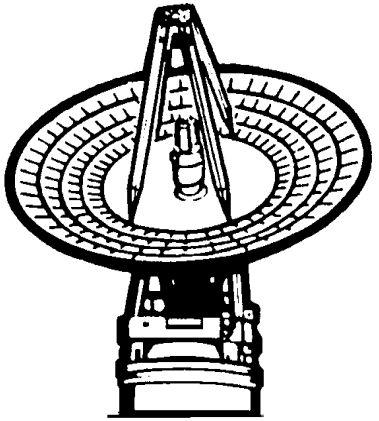
Resource Contention

Version 2.0

2000 - 2009

Frank Leppla





August 3, 1999

The entire Resource Contention for 2000 - 2009 is published as the "Red Book" at this website:

http://rapweb.jpl.nasa.gov/red29908.pdf

CONTENTION RESOLUTION

2000 Contentions:

Contention Period #1 2000 Weeks 05-08;DSS-14
Radio Astronomy agreed to reduce to one support on alternate weeks for Microwave Spectroscopy and Planet R/AST to aid Galileo and NEAR. Space VLBI agreed to reduce to 2-3 passes per week to aid Galileo and NEAR. Note: Mars 98 Program Surface Operations will reduce from 10-hours per day to 3-hours per day. This is for the 70-meter requirement only and three 3-hours must be placed from 11am to 2pm Mars local solar time.

Contention Period #2 2000 Weeks 07-08; DSS-63
Radio Astronomy agreed to move RA500 WCB support to week 6 to aid Galileo and NEAR. RAPSO recommend Radio Astronomy move RA500 WCB to week 8. Space VLBI agreed to reduce to 2-3 passes per week to aid Galileo and NEAR. Note: Mars 98 Program Surface Operations will reduce from 10-hours per day to 3-hours per day. This is for the 70-meter requirement only and three 3-hours must be placed from 11am to 2pm Mars local solar time.

Contention Period #3 2000 Week 7-17; DSS-43
DSS-14 is down weeks 09-18 for X-band uplink. Galileo agreed to delete routine pass on DOY 047 to aid NEAR Critical Playback and M98 Surface Operations. M98 Program Surface Operations agreed to start pass on DOY 047 after 0615 to aid NEAR Critical Playback. Space VLBI agreed to reduce to 1-2 passes per week in weeks 09-13. Ulysses agreed to delete two 10-hour passes per week at DSS-43 and add seven 4-hour passes per week at DSS-34 to augment the seven 8-hour passes per week at DSS-34. Note: Mars 98 Program Surface Operations will reduce from 10-hours per day to 3-hours per day. This is for the 70-meter requirement only and three 3-hours must be placed from 11am to 2pm Mars local solar time.

Contention Period #4 2000 Weeks 20-24; DSS-14
Radio Astronomy agreed to reduce to one support on alternate weeks for Microwave Spectroscopy and Planet R/AST to aid Galileo and NEAR. Space VLBI agreed to reduce to 2-3 passes per week to aid Galileo and NEAR.

Contention Period #5 2000 Weeks 28-34; DSS-14
Galileo agreed to reduce passes to 5-6 hours, DOY 218-222, to aid GSSR Asteroid Mithra. Radio Astronomy agreed to reduce to one support on alternate weeks for Microwave Spectroscopy and Planet R/AST to aid Galileo and Goldstone Solar System Radar. Space VLBI agreed to reduce to 2-3 passes per week.

Contention Period #6 2000 Weeks 29-30; DSS-43
DSS-63 is down in weeks 28-30 for Motor Control Center Replacement. Radio Astronomy agreed to delete support for Microwave Spectroscopy. Ulysses agreed to reschedule to segmented passes at DSS-24 and 43. SVLB agreed to reduce to 2-3 passes per week.

Contention Period #7 2000 Weeks 43-44; DSS-14
Radio Astronomy agreed to delete support for RA500 WCB to aid Gravity Probe B, but will try to find an alternative time in November. Radio Astronomy agreed to delete support for Microwave Spectroscopy in weeks 43-44 to aid Gravity Probe B. Space VLBI agreed to reduce to 2-3 passes per week.

Contention Period #8 2000 Weeks 46-50; DSS-14
Action Item #4 was assigned to GLL and GSSR. Goldstone Solar System Radar will provide updated Jupiter Radar requirements. Goldstone Solar System Radar will attempt to clarify Jupiter Radar requirements and spread them over 2-3 months. Galileo objected to reducing support to 3 passes per week to aid Goldstone Solar System Radar.

Contention Period #9 2000 Week 52; DSS-14, 63
Galileo agreed to reduce routine passes to 7 passes per week to aid NEAR. Radio Astronomy agreed to delete support for Planet R/AST but requested a support in early December at DSS-14. Space VLBI agreed to reduce to 3 passes to aid Galileo Encounter.

Contention Period #10 2000 Weeks 02-08; 34HEF
Cassini agreed to use DSS-65 for the TLM/RNG I/F Test and move to DOY 038 to aid Stardust, Mars Global Surveyor and DSS Maintenance. DSS Maintenance agreed to reduce to 4 hours in week 7 at DSS-65. Mars 98 Program Surface Operations objected to the proposal to reducing two passes per week in weeks 07-08 to 8 hours. Mars Global Surveyor and Stardust will work to resolve contention. NEAR agreed to move support to DSS-25, 34 and 54 in weeks 07-08. Voyager 1 agreed to reduce support at DSS-65 to 4 hours.

Contention Period #11 2000 Weeks 09-17; 34HEF
Action Item #5 was assigned to Cassini and Mars project. Cassini objected to move of support to week 19 DOY 135 and week 23 DOY 159, because they are in the middle of superior conjunction, which occurs on May 8, 2000 (DOY 129, week 19). Cassini requested 34 HEF/70 Meter for CDS SWAP. RAPSO recommended using DSS-43, 45 for CDS SWAP. Deep Space 1 agreed to move support in week 12 to the BWG to aid Mars Polar Lander (M98L), Mars Global Surveyor, NEAR, Stardust and Voyager 2. DSN (CAT M&E) agreed to move support to week 21 and 30 to aid Mars Polar Lander, Mars Global Surveyor, NEAR, Sardust and Voyager 2. Mars 98 Program Surface Operations agreed to MSPA 5 passes per week with Mars Global Surveyor in weeks 14-17 to aid NEAR. Mars Global Surveyor tentatively agreed to use 4 and 6-hour split passes between HEF and DSS-25 or DSS-54 in weeks 09-13 to aid DSS Maintenance, Mars Polar Lander (M98L) and Stardust. Mars Global Surveyor will MSPA 5 passes per week with Mars Climate Orbiter (M98O) in weeks 14-17 to aid NEAR. NEAR agreed to reduce two passes per week to 4 hours in weeks 13-17 to aid DSS Maintenance, Mars Polar Lander (M98L), Mars Global Surveyor, Stardust and Voyager 2. Mars Global Surveyor will present their new requirements at the September JURAP.

Contention Period #12 2000 Weeks 05-06;34BWG1
Both Cassini and Deep Space 1 agreed to use DSS-25 to aid NEAR (EROS Rendezvous). DSS Maintenance agreed to reduce DSS-24 support to 6-hours to aid Ulysses, Voyager 1 and Wind. Ulysses agreed to reduce passes to 8-hours and use DSS-24, 34 to aid NEAR. Voyager 1 agreed to reduce DSS-24 passes to 4-5 hours to aid DSS Maintenance, Ulysses and Wind. Wind agreed to move Lunar Backflip support to the 26 Meter subnet and move TCM support to DSS-27 to aid Ulysses and Voyager 1. Note: Wind indicated that they had flexibility in the amount of hours scheduled.

Contention Period #13 2000 Week 12; DSS-34, 54
Cassini objected to moving their CDS flight software load to week 14 because ensuing activities would conflict with superior conjunction. In addition, Cassini tentatively agreed to reduce to 19-hours with a shorter DSS-34 support for the CDS flight software load. Reference contention #11.

Contention Period #14 2000 Weeks 18-19; 34BWG1
DSS-45 is down in weeks 18-19 to Replace Subreflector Drive. Cassini agreed to use DSS-25 and 54. Voyager 1 agreed to reduce support at DSS-54 to 4-6 hours to aid NEAR Prime Science. Voyager 2 agreed to reduce support at DSS-54 to 4-6 hours to aid NEAR Prime Science. NEAR agreed to reduce 8-hour passes to 6 hours to aid Cassini, Deep Space 1, Voyager 2 and Ulysses. Ulysses agreed to adjust hand-overs to Goldstone and Madrid to allow support at DSS-34.

Contention Period #15 2000 Week 39; DSS-34, 54
Mars Climate Orbiter (M98O) agreed to MSPA with MGS 4 passes per week on 34 HEF to aid Deep Space 1, NEAR and Voyager 2. NEAR agreed to reduce pass to 4 hours to aid Deep Space 1, Ulysses and Voyager 2.

Contention Period #16 2000 Weeks 45-52; 34BWG1
Action Item #6 was assigned to Deep Space 1. Deep Space 1 tentatively agreed to use DSS-25 for routine support; reduce one pass to 7 hours in each of weeks 46, 48, and 51; use DSS-25, 34, 65 for comet support in week 51; reduce one comet pass in week 52 to 4 hours and move one pass to DSS-45 to aid DSS Maintenance, NEAR and Ulysses. Deep Space 1 will present their new trajectory at the October JURAP. DSS Maintenance agreed to reduce DSS-34 and 54 support in week 52 to 4 hours. Microwave Anisotropy Probe (MAP) agreed to move support to the 26-Meter subnet. Mars Global Surveyor agreed to move science campaign to week 46 to aid Deep Space 1. Mars Global Surveyor requested to retain one day of continuous coverage in week 48. Stardust agreed to use DSS-25 and 54 for 8-hour passes in week 46 to aid Mars Global Surveyor. NEAR agreed to move two DSS-34 passes in week 52 to DSS-43 to aid Deep Space 1, Ulysses and Voyager 2. NEAR also agreed to take a 5-hour gap in week 52 (DOY 363, 364) to aid GLL.

Contention Period #17 2000 Weeks 37-40; DSS-25
DSS Maintenance agreed to reduce support to 6 hours in weeks 38-40 to aid Deep Space 1, Cassini and Mars Climate Orbiter (M98O). Mars Climate Orbiter (M98O) agreed to MSPA with Mars Global Surveyor on the 34HEF three passes per week to aid Cassini, Deep Space 1, DSS Maintenance and Stardust.

Contention Period #18 2000 Weeks 45-52; DSS-25
Deep Space 1 agreed to reduce one pass per week in week 48 and 52 to 4 hours to aid DSS Maintenance. DSS Maintenance agreed to reduce support in weeks 46, 48, 51 and 52 to 4-6 hours to aid Deep Space 1. NEAR agreed to delete pass at DSS-25 and use DSS-14 uplink for 5 passes per week to aid DSS Maintenance and Deep Space 1.

Contention Period #19 2000 Weeks 07-12; 26M
Polar agreed to move real-time support to DSS-16, 46 and playback support to DSS-16, 27 and 46 to aid IMAGE launch and IOC support. SOHO agreed to reduce seven 9.6-hour passes to 4 hours, and delete TSO in week 9 to aid IMAGE. NOTE: SOHO deletions result in science data loss. NASA Headquarters Code S will be notified of the contention resolution. TDRS noted tentative plan to launch on March 1, 2000.

Contention Period # 20 2000 Weeks 27, 29, 33, 41, 45, 46 and 49; DSS-16, 66
DSS Maintenance agreed to reduce maintenance to 6-hours in weeks 27, 29, 33, 41, 45, 46 and 49 to aid Advanced Composition Explorer, Cluster 2 and SOHO.

Contention Period # 21 2000 Weeks 34-37; 26M
Requested downtime at DSS-16 for Servo Hydraulic Drive granted. DSS Maintenance agreed to reduce DSS-27 and 66 support to 6-hours in weeks 34-37 to aid Advanced Composition Explorer, Geotail, Polar and SOHO. SOHO agreed to reduce 9.6-hour passes in weeks 34-37 to 6-hours using DSS-27, 66 and move TSO to week 38 to aid DSS Maintenance.

2001 Contentions:

Contention Period #22 2001 Weeks 01-06; DSS-14
Gravity Probe B agreed to reschedule to week 11 to aid Galileo and NEAR. Radio Astronomy (Planet R/AST) agreed to reduce to one support on alternate weeks and reschedule Radio Astronomy (RA500 WCB to week 13. RASA (Microwave Spectroscopy) agreed to delete support to aid NEAR. Space VLBI agreed to reduce to 1-2 passes per week.

Contention Period #23 2001 Week 04; DSS-43
DSS Host Country agreed to reschedule to week 08 to aid GLL.

Contention Period #24 2001 Weeks 15-17; DSS-43
Action Item #6 was assigned to Deep Space 1. Deep Space 1 objected to the recommendation to delete support to aid DSS Maintenance and Ulysses. Deep Space 1 will present their new trajectory at the October JURAP. RAPSO will re-evaluate recommendation. DSS Host Country agreed to reschedule

support to week 25. Radio Astronomy agreed to delete support for Microwave Spectroscopy. Space VLBI agreed to reduce support to 2-3 passes per week. Ulysses agreed to move one pass to DSS-34 to aid DSS Maintenance.

Contention Period #25 2001 Weeks 27-30; DSS-63
Gravity Probe B agreed to reschedule to week 24 to aid Ulysses nutation support. Radio Astronomy agreed to delete support for VLBA WCB. Radio Astronomy agreed to be move RA500 to week 25. Space VLBI agreed to reduce to 2-3 passes per week to aid Ulysses.

Contention Period #26 2001 Weeks 42-44; DSS-14
Goldstone Orbital Debris Radar agreed to reschedule to weeks 49 and 51 to aid Ulysses nutation support. Radio Astronomy agreed to reduce to one support on alternate weeks for Microwave Spectroscopy and Planet R/AST to aid Ulysses.

Contention Period #27 2001 Weeks 01-04; 34HEF
Action Item #6 was assigned to Deep Space 1. Deep Space 1 agreed to move one DSS-15 pass to DSS-25, and move two DSS-65 passes to DSS-63 to aid DSS Maintenance and NEAR; Deep Space 1 reluctantly agreed to delete 1.5 passes at DSS-45. Deep Space 1 will present their new trajectory at the October JURAP. Mars Climate Orbiter (M98O) and Mars Global Surveyor agreed to split into contiguous segmented 4-hour passes to aid Deep Space 1, DSS Maintenance, NEAR and Voyager 2. NEAR agreed to move one DSS-15 and DSS-25 pass to DSS-14 to aid DSS Maintenance and Deep Space 1. Voyager 2 agreed to reduce to 6 passes per week at DSS-45 and one 4-hour pass at DSS-43.

Contention Period #28 2001 Weeks 01-06; 34BWG1
Mars Global Surveyor agreed to split into 5-hour passes to aid DSS Maintenance, Genesis, NEAR and Voyager 2. The two 5-hour passes must be contiguous. SOHO agreed to reduce one pass to 2-hours in weeks 02-04 and 06 to aid DSS Maintenance. Stardust agreed to move all DSS-34, 54 passes to DSS-45, 65 in weeks 01-02 to aid NEAR. Voyager 2 agreed to reduce to six 4-hour passes at DSS-34 and one 4-hour pass at DSS 43.

Contention Period #29 2001 Weeks 08-12; 34BWG1
Deep Space 1 agreed to use DSS-25, 65 for their 8-9 hour passes and retain one 8-9 hour pass at DSS-34, 45 to aid Ulysses. Ulysses agreed to move 2 passes per week to DSS-14 in weeks 10-12 and DSS-63 in week 10 to aid DSS Maintenance. Ulysses may also get coverage at the Peru backup site. Voyager 2 agreed to reduce one 8-hour and two 4-hour passes at DSS-34 to aid DSS Maintenance, Stardust and Deep Space 1.

Contention Period #30 2001 Weeks 14-15; 34BWG1
Chandra X-ray Observatory agreed to use DSS-24, 54 only to aid Mars 01 Orbiter launch. DSS Maintenance agreed to reduce to 4-hours in week 15 at DSS-34 to aid Mars 01 Orbiter. Mars 01 Orbiter also agreed to move one pass in week 14 to DSS-45 to aid DSS Maintenance. Mars Climate Orbiter (M98O) and Mars Global Surveyor will coordinate support with Deep Space 1 and DSS Maintenance. Voyager 1 agreed to delete three passes per week at DSS-54 in week 15 to aid Mars Climate Orbiter (M98O) and Mars Global Surveyor. Wind agreed to use DSS-24, 54 only to aid Mars 01 Orbiter.

Contention Period # 31 2001 Weeks 19-21; 34BWG1
Ulysses agreed to move one pass per week in weeks 19-20 to DSS-14 to aid DSS Maintenance. Voyager 2 agreed to reduce all passes to 6-8 hours.

Contention Period #32 2001 Weeks 44-46; DSS-24
Voyager 1 agreed to reduce to 2-4 hours per pass to aid Ulysses nutation. NOTE: MSOP asked for the long overlaps between SPC-10 and SPC-40 to be allocated to the MSPA supports.

Contention Period #33 2001 Weeks 48-52; DSS-34, 54
Mars 01 Orbiter agreed to move to DSS-43, 63 for weeks 48-52 and MSPA with Mars Climate Orbiter (M98O) and Mars Global Surveyor excluding DOY 354-361. Mars Climate Orbiter (M98O) and Mars

Global Surveyor agreed to move to DSS-43, 63 and MSPA with Mars 01 Orbiter excluding DOY 354-361 and remain at DSS-34, 54 on DOY 354-361.

Contention Period #34 2001 Weeks 48-52; DSS-25
DSS Maintenance agreed to reduce to 6 hours. Mars 01 Orbiter agreed to MSPA with Mars Climate Orbiter (M98O) and Mars Global Surveyor excluding DOY 354-361. Mars Climate Orbiter (M98O) and Mars Global Surveyor agreed to move to DSS-14 or 15 on DOY 354-361; MSPA with Mars 01 Orbiter excluding DOY 354-361.

Contention Period #35 2001 Weeks 01-06; 26M
Advanced Composition Explorer agreed to use DSS-24, 27 and 46. Cluster 2 agreed to use DSS-16, 27 and 46. DSS Maintenance agreed to perform maintenance in non-daylight hours to aid Advance Composition Explorer, Cluster 2 and Genesis launch. SOHO agreed to 8-hour passes at DSS-24, 27 and delete all 1.6-hour passes in weeks 02-03 to aid Genesis launch. NOTE: SOHO deletions result in science data loss. NASA Headquarters Code S will be notified of the contention resolution.

Contention Period #36 2001 Weeks 16-28; 26M
Advance Composition Explorer agreed to use DSS-16, 66. DSS Maintenance agreed to reduce DSS-16 and 66 maintenance to 6 hours passes in weeks 16-21 to aid Advance Composition Explorer, Polar and SOHO. Genesis agreed to move DSS-46 support to DSS-34 and use DSS-16 for 8-hour passes to aid Advance Composition Explorer, DSS Maintenance, Polar and SOHO. Polar agreed to use DSS-27 and 26 Meter subnet. SOHO agreed to reduce two passes per week to 4 hours to aid Advance Composition Explorer and DSS Maintenance. NOTE: SOHO deletions result in science data loss. NASA Headquarters Code S will be notified of the contention resolution.

2002 Contentions:

Contention Period #37 2002 Weeks 03-04; DSS-14
Action Item #7 was assigned to Mars 01 Orbiter. DSS Maintenance agreed to delete bearing maintenance in week 03 and to perform routine maintenance in non -daylight hours to aid Goldstone Solar System Radar (Asteroid Nereus). European VLBI Network agreed to reschedule support to week 01 to aid DSS Maintenance, Goldstone Solar System Radar, Mars 01 Orbiter and Microwave Anisotropy Probe (MAP). Mars 01 Orbiter objected to using DSS-43, 63 to aid Goldstone Solar System Radar and Microwave Anisotropy Probe. Mars 01 Orbiter needs two 70-Meter passes per day. Mars 01 Orbiter will not know their landing site until the end of January 2000.

Contention Period #38 2002 Weeks 43-45; DSS-14
DSS Maintenance and Mars 01 Orbiter agreed to accommodate Goldstone Solar System Radar (Asteroid 1997XF11). Radio Astronomy Microwave Spectroscopy and Planet R/AST agreed to delete support. Radio Astronomy Radio Stars WCB agreed to reschedule support to week 46. Radio Astronomy VLBA WCB agreed to reschedule support to week 48. Voyager 1 (ASCAL) agreed to reschedule support to DSS-63 to aid Goldstone Solar System Radar. Voyager 1 (MAGROL) agreed to reschedule to DSS-25 to aid Goldstone Solar System Radar.

Contention Period #39 2002 Weeks 01, 03, 04: 34HEF, BWG1, BWG2
OSSA (Space Geodesy Program) agreed to move support to weeks 06-07. Mars Global Surveyor and Mars Climate Orbiter (M98O) plan to MSPA during this period. Space Infrared Telescope Facility agreed to use DSS-25 in week 01 to aid Cassini. Voyager 1 agreed to reduce to one 6-hour daily pass at DSS-24 or 54. Voyager 2 agreed to reduce to 6-hour passes and use DSS-43.

Contention Period #40 2002 weeks 23-28; 34HEF, BWG1, BWG2
Comet Nucleus Tour agreed to use DSS-15. DSN agreed to delete CAT M&E support. Goldstone Solar System Radar agreed to delete Goldstone Orbital Debris Radar support in week 26. OSSA (Space Geodesy Program) agreed to delete support in weeks 24 and 27. Voyager 1 agreed to reduce passes to 8-hours at DSS-24 only. Voyager 2 agreed to reduce to 10-hour supports and use DSS-43 and 34 in weeks 23-25 and 28. In addition, Voyage 2 agreed to reduce to 10-hour supports and use DSS-43 in weeks 26-27.

RESOURCE ALLOCATION REVIEW

ACTION ITEMS

FROM 03 AUGUST RARB

JPL

Gene Burke

Action Item Summary

AI#	CP#	Year	Month(s)	Week(s)	System	Responsible	Due Date	Status
01	**n/a**	**1999**	**---**	**---**	**All**	**All Projects E. Burke**	**Monthly thru 3/2000**	**Open**

ACTION: Y2K: All projects that will be in operations between November 1999 and February 2000 identify critical mission periods and send the list of periods and the activity description to E. Burke beginning 2/28/99. Update on the last Friday of each month through 2000. E. Burke will consolidate and provide to G. Squibb.

02	**n/a**	**1999**	**---**	**---**	**All**	**All Projects E. Burke**	**Monthly thru 3/2000**	**Open**

ACTION: Y2K: All projects that will be in operations during the Y2K +36 turnover (1999 to 2000): For the period Y2K -24 hours through Y2K +36 hours (both 0000 UTC, 1 Jan 2000 and 0000 UTC 29 Feb 2000) identify all command periods and science downlink periods for your missions. For each period identify effects of missing the period. Update monthly on the last Friday of each month through March 2000. Submit to E. Burke, who will consolidate and provide to G. Squibb.

03	**n/a**	**2000 2001 2002**	**---**	**---**	**RAPSO**	**D. Morris**	**30 Oct 1999**	**Open**

ACTION: RAPSO advise new and current projects of the needed detail in tracking requirements, by phase of Project development, for mid-range and long-range planning.

04	**08**	**2000**	**November**	**46-50**	**DSS-14**	**J. Erickson M. Slade**	**16 Sep 1999**	**Open**

ACTION: Galileo re-evaluate extended mission requirements; Goldstone Solar System Radar clarify Jupiter radar requirements spreading support over 2 months. Due September JURAP Meeting.

05	**11**	**2000**	**February**	**09-17**	**34HEF**	**B. Mitchell R. Cook**	**16 Sep 1999**	**Open**

ACTION: Cassini and Mars programs (MGS and M98) submit new Mission information, requirements, and plans at September JURAP Meeting.

06	**16 24 27**	**2000 2001 2001**	**November April January**	**45-52 15-17 01-04**	**BWG1 DSS-43 34HEF**	**P. Chadbourne**	**15 Oct 1999**	**Open**

ACTION: Deep Space One provide new trajectory and mission design information at the October JURAP Meeting.

07	**37**	**2002**	**January**	**03-04**	**DSS-14**	**R. Cook**	**31 Jan 2000**	**Open**

ACTION: Mars 2001 Orbiter provide landing site and viewperiod information by the end of January 2000 (Note: may affect proposed DSS-14 Hydrostatic Bearing Runner Rehabilitation downtime period).